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ABSTRACT

Parent Child Development Center (PCDC) programs are designed for mothers and young children with goals similar to those of earlier compensatory education programs: to enhance the development of young children and to try to offset educational and occupational problems associated with poverty. The basic strategy is preventative: helping parents become more effective child-rearing agents in reaching the goals for children. This report incorporates the original Phase I data with the data collected from 1976 to 1980 to provide a comprehensive evaluation of the entire project. The two major issues addressed in the report are the short-term and long-term impacts of the PCDC program. The organization of the report is as follows: Chapter 2 describes the history of the PCDC project, Chapter 3 provides a description of the general PCDC concept as well as the unique features of the models in the three sites, Chapter 4 presents the evaluation design, Chapters 5 and 6 present the short-term and long-term impact results. Chapter 7 describes the results of the replication attempt in Detroit, and Chapter 8 presents the final conclusions and policy implications. (Author/GK)

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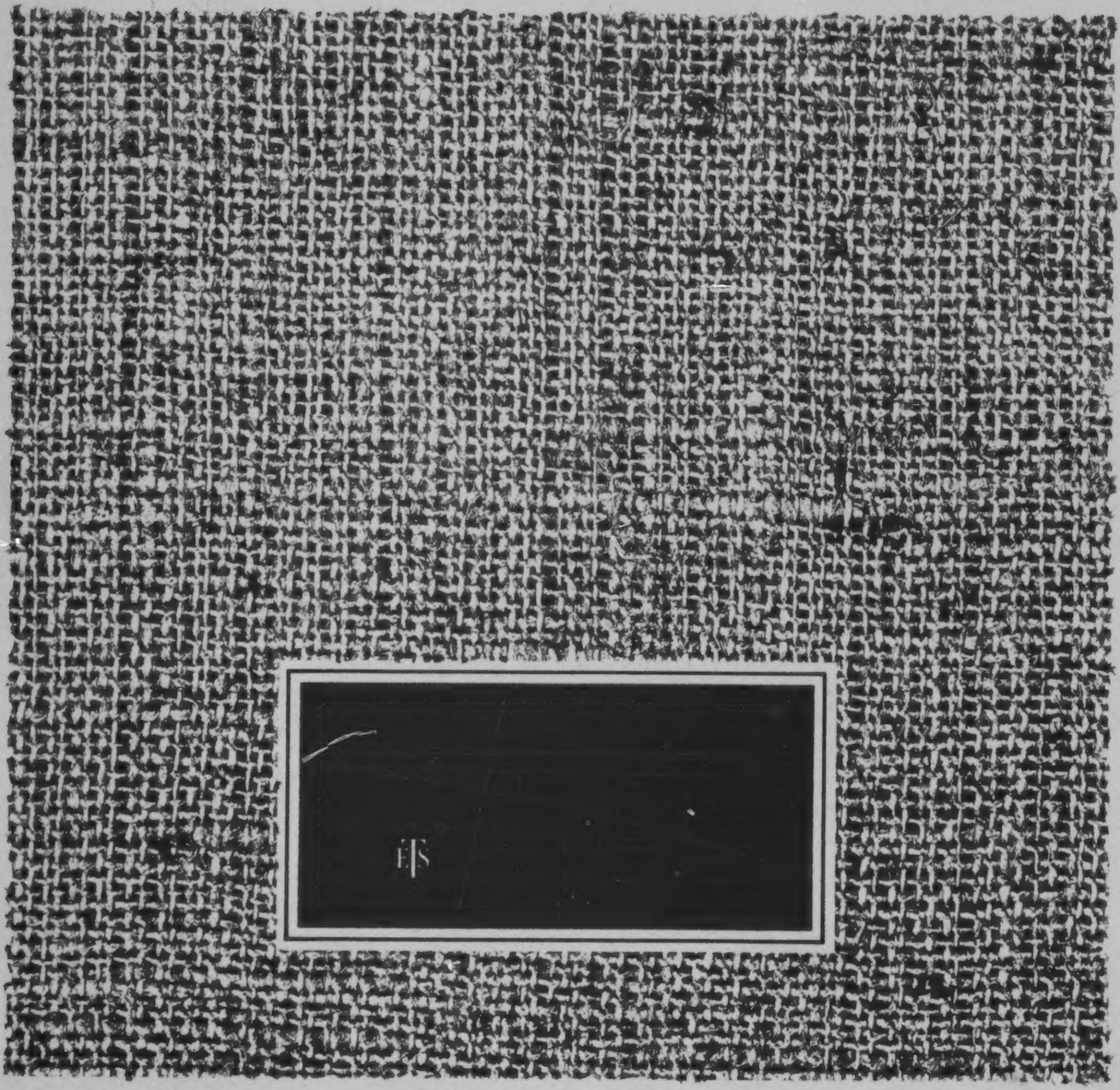
PARENT CHILD DEVELOPMENT CENTER:

FINAL EVALUATION REPORT

Contract Number HEW-105-78-1302

Submitted to:
Department of Health and Human Services
Office of Human Development Services
Washington, DC 20201

April, 1981



TM 820 210

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Contract Number HEW-105-78-1302

Brent Bridgeman

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Submitted to:

Department of Health and Human Services
Office of Human Development Services
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April, 1981

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Chapter 1

Introduction

The Parent Child Development Center Project developed in recognition of the importance of parents in the child's development of competence and in response to the priority placed on policies designed to benefit families and children. The Parent Child Development Center (PCDC) programs are designed for mothers and young children with goals similar to those of earlier compensatory education programs: to enhance the development of young children and to try to offset educational and occupational problems associated with poverty. The basic strategy of the PCDC programs is preventative in helping parents become more effective child-rearing agents as the primary path to reaching the goals for children.

All PCDC programs share several common features that define the PCDC approach to parent education. PCDCs must actively engage low-income families with young children between the ages of birth and three years. They are multidimensional programs that provide a range of information and experiences to parents on children's development, child-rearing techniques, health, nutrition, home management, adult skills in relating to organizations and institutions and community resource utilization, and at the same time offer social activities and social and health services.

The programs are interdisciplinary and are conducted in an atmosphere that is supportive and flexible and provides opportunities for participating in different ways and for using new information and skills. An important dimension in this milieu is the support group provided by the mothers themselves, facilitating interaction among mothers and opportunities for sharing and discussing experiences.

Because of the comprehensive nature of the programs, in which the mother is the central focus, additional benefits to the family are expected. Mothers are expected, for example, to increase their social and family management skills and, subsequently, their feelings of self-worth, as well as their potential for future employment. Fathers are expected to increase their understanding of and involvement in the child-rearing task. Finally, benefits are expected to accrue to older children and to children born subsequently to participant families.

Background of PCDC Project

The PCDC Project was begun by the Office of Economic Opportunity (and later continued by the Office of Child Development, now known as the Administration for Children, Youth and Families) to formulate, develop, test, and document potentially replicable program models. The model building or program development and evaluation phase was the first of a two-phase experimental strategy. Three PCDC programs were funded in 1970-71 in Birmingham, Houston, and New Orleans. In the first five years of Phase I, the programs were developed, and essential aspects of their theory and practice documented and their effects tested (Johnson, Kahn, & Leler, 1976; Lasater, Malone, & Ferguson, 1976; Blumenthal, Andrews, & Weiner, 1976).

On the basis of positive and significant program effects, the second phase of the experiment was initiated in 1975. The three original programs were to be replicated in different communities, with different populations to see whether the replications, too, would yield positive program effects. A national replication management organization housed in a private institution, Bank Street College of Education, was set up to guide, monitor, and document replication processes.

At the beginning of Phase II, each of the three PCDC programs was replicated once, Birmingham in Indianapolis, Houston in San Antonio, and New Orleans in Detroit. A uniform cross-site evaluation was also planned for the second phase. However, the external evaluation was not funded concurrently with the replication management organization as originally planned. Educational Testing Service was funded in 1978 to develop an evaluation plan. During the period from 1975 to 1978, research had continued at each site on a piecemeal basis, with scarcely enough money to support minimum data collection. As a result, the original research staffs were severely reduced. ETS was just beginning to design the follow-up and replication study when ACYF announced that the replication experiment would have to be terminated because of lack of financial support. ETS was directed to use its remaining funds to analyze the data collected during the interim period. ACYF authorized Bank Street College to continue limited data collection during the period from 1978 to 1980.

Contents of Report

This report incorporates the original Phase I data with the data collected from 1976 to 1980 to provide a comprehensive evaluation of the entire project. The two major issues addressed in the report are the short-term and long-term impacts of the PCDC program. Short-term impacts are those that are observable at the time of graduation from the PCDC programs (when the target child is 36 months of age), whereas long-term impacts were assessed up to five years after program graduation.

The Phase I reports from each site indicated significant short-term impacts on mothers and children. The number of graduates of the program has more than doubled since these reports were written; and it is now possible to evaluate whether the data from the later cohorts of children strengthens or weakens the original findings. Were the initial favorable results attributable solely to the enthusiasm of mothers and staff participating in new and innovative programs, or would the effects be replicated with new cohorts of mothers and children who attended more established programs? The larger sample sizes now available also permitted investigation of some additional issues. In particular, it was possible to determine whether PCDCs were more effective for families with particular kinds of background characteristics.

In the Phase I reports, none of the target children were older than 48 months of age. By 1980 a substantial number of target children had passed their fifth birthdays (two years after graduation from the program), and some of the early graduates were in third grade. Thus, a major focus of this report is on the long-term effects of the PCDC program.

Although the original idea of a replication experiment was dropped, data from the two cohorts of the Detroit replication of the New Orleans model were available. One chapter in this report describes the results from the Detroit replication site.

It is important to note that this report is not an attempt to answer all of the interesting and important questions that could be addressed with the PCDC data base. This report is primarily a program evaluation. Many interesting developmental questions could be addressed with the PCDC data base but are beyond the scope of the current undertaking. Thus, for example, some of the measures of mother-child interaction in the first year of the child's life would be very useful in a developmental study but remain unanalyzed here.

The organization of the report is as follows: Chapter 2 describes the history of the PCDC project, Chapter 3 provides a description of the general PCDC concept as well as the unique features of the models in the three sites, Chapter 4 presents the evaluation design, Chapters 5 and 6 present the short-term and long-term impact results. Chapter 7 describes the results of the replication attempt in Detroit, and Chapter 8 presents the final conclusions and policy implications.

Chapter 2

Overview and History of the PCDC Project

The Parent-Child Development Center (PCDC) experiment represents a decade-long investment by the Federal Government in parent education research. First funded in 1970, the PCDCs had two major objectives: (a) to develop and evaluate parent education programs for improving the educational future of children from low-income families and (b) to demonstrate a strategy for program development, evaluation, and dissemination for influencing social policy.

The three PCDCs were originally part of a national network of Parent Child Centers funded by the Office of Economic Opportunity in the late 1960s. The Parent Child Centers were an outgrowth of three converging strands of thought in the 60s: emphasis on early childhood as an important time for cognitive and social development; emphasis on the role of the home environment in child development; and concern for providing programs for low-income children who were not developing to their full potential. The PCCs were aimed at providing educational and support services to low-income families with infants and children under age 3. It was hoped that by involving the mother as the major focus of the program, and starting the program shortly after the birth of the target child, long-term positive gains for the child would be more probable. Because no single program model or evaluation strategy had been mandated, the PCCs had considerable independence in deciding how to carry out their objectives. In 1969-1970, three PCCs, located in Birmingham, Houston, and New Orleans, were selected on the basis of research proposals to form the nucleus of the Parent Child Development Center Experiment.

Two phases of the PCDC experiment were planned. Phase I, from 1970-1975, was to emphasize development, documentation, and internal evaluation of three parent education models. Although established under central administrative guidelines, each model was to be developed independently. During this phase, the programs were to be documented and their effects evaluated, using randomly assigned program and control groups. These evaluations were to be independent and on-site in order to be closely tailored to the goals of the individual programs, as well as to encourage experimentation with assessment and measurement problems.

If the data from Phase I showed promising program effects, a 5-year replication of the three program models in other communities was to be undertaken as a second phase of the project. A uniform, external cross-site evaluation was planned for this phase. The external evaluation would include long-term follow-up on the original participants as well as evaluation of continuing program effects on new participants in the original and replication sites.

Phase I was carried out as planned. The Phase I research findings established that the program models developed at the 3 PCDC sites had positive effects. Phase II began in 1975, with support from both public and private sources. The Lilly Endowment was the first and primary supporter of the replication effort, joined by the Charles Mott and the Hogg Foundations. They supported replications of the Birmingham PCDC program in Indianapolis, the Houston PCDC in San Antonio, and the New Orleans program in Detroit, as well as Bank Street College of Education to oversee and document the program replication process. ACYF continued to fund the three original PCDCs through Bank Street College. However, the planned external evaluation agency was not funded concurrently by the Administration for Children, Youth, and Families (ACYF) because of the growing scarcity of financial resources. ACYF did anticipate eventual funding; and in order to continue data collection during the interim period, the research at each original site was continued, although at reduced funding levels. Each site was asked to collect baseline data at its corresponding replication site, as well as to continue collecting internal data on program effects. The children in the early cohorts were growing up; as resources permitted, limited follow-up data was to be collected. For administrative purposes, beginning in 1977 research funding for the three sites was funneled centrally through Bank Street College of Education, which was also administering the program monies.

In 1978, ACYF funded Educational Testing Service to begin development of the external evaluation plan. At the same time, unfortunately, there was a growing scarcity of funds for human services projects at all levels--federal, state, local, and private. The private foundations that had been supporting the replication for three years were nearing the end of their commitments; other funding sources for the replications were not readily obtainable. ETS was just beginning to design the follow-up and replication study when ACYF determined that the replication experiment should be terminated because of lack of financial support for both the replication sites and the external evaluation effort. The original sites and their internal evaluations would continue to receive ACYF funds until 1980. ETS was directed to use its remaining funds to analyze the on-site data collected during the interim period, and to write a report summarizing PCDC program effects based on all of the available data.

Current Status of the Programs/FY '81

The three original PCDCs are funded out of regional Head Start monies; the PCDCs have reverted to the same administrative status as the PCCs. The San Antonio replication closed because of lack of funds in 1979, as did the Detroit PCDC in 1980. The Indianapolis PCDC is currently operating under Title XX funds.

The current report summarizes the program evaluation data collected in the PCDCs 1970-1980. Although the replication phase of PCDC did not take place, the ten-year evaluation data itself, involving several hundred randomly assigned program and control group children in three sites, provides a unique longitudinal data base for investigating the effects of parent education.

Chapter 3

The PCDC Model Programs

Program developers at the three Phase I sites were required by the sponsoring agency to observe five major guidelines for program design:

1. The PCDCs were to serve low-income populations.
2. Primary participants were to be mothers or other primary caregivers.
3. The target age for children was to be birth to 3 years.
4. The programs were to be of sufficient duration and intensity to maximize their potential effectiveness.
5. The programs were to be directed at the complex problems of poor families and were to include a broad range of support services.

These guidelines constituted the overall PCDC "model" of parent education, which was intended to aid low-income children by helping mothers become more effective agents in their young children's development. The three PCDCs adopted common strategies for accomplishing this goal: sharing with mothers the burgeoning knowledge of infant and child development, promoting the mothers' personal development, and supporting the whole family with appropriate services. All three centers included simultaneous programs for mothers and for children; other family members were involved to varying degrees.

The adult-oriented curricula included a wide variety of content. Material about the socioemotional, intellectual, and physical development of children was taught through practical experience in the children's nursery or laboratory programs and through group discussions. Adult development covered such subjects as home management, nutrition and health, personal development, community resources and government, and other areas of continuing education. All three programs provided participants with transportation, some meals, family health and social services, a program for siblings, and a small daily stipend.

From the beginning, the program style was supportive and flexible, with opportunity for different types of participation and for using new knowledge and skills. The basic aim of the staffs was to reinforce the mothers' abilities and strengths. Staff members generally were from the same cultural and ethnic backgrounds as the participating mothers, and they represented a variety of educational and professional qualifications. Staff development was an integral part of the programs.

Although the basic design elements of this general PCDC model were incorporated in all three programs, there were, by choice, differences among the programs in several other areas. The most important of these were entry age of the child and intensity of participation. Although all three programs ended when the child was 36 months of age, they began at different ages and called for different amounts of weekly participation. The centers' deployment of professional and paraprofessional staff, the roles for adult participants, and the teaching-learning formats for adults and children also varied. These differences reflected both theoretical predilections and sensitivity to the participating community, and we considered the three programs different expressions of the general PCDC model. Differences among the programs are highlighted in Table 3.1 and are described in more detail in the remaining sections of this chapter.

TABLE 3.1

DISTINCTIVE FEATURES OF THE THREE PCDC PROGRAMS

Program Feature	Birmingham PCDC	Houston PCDC	New Orleans PCDC
Population			
Ethnic background	Heterogeneous (black & white)	Bicultural-bilingual (Hispanic, Mexican-American)	Homogeneous (urban black)
Age range of mothers	Open	Open	17 to 35
Approximate entry age of child	3-5 months	12 months	2 months
Locus of program	Center only	Year 1: Home Year 2: Center	Center only
Length of program	31-33 months	24 months	34 months

TABLE 3.1--CONTINUED

Program Feature	Birmingham PCDC	Houston PCDC	New Orleans PCDC
Amount of contact	Increased with child's age/length of mother's participation: 12 hrs/week: to 11 mos 20 hrs/week: 12-17 mos 40 hrs/week: 18-36 mos	Year 1 Home visit: 1½ hrs/week Language class (English): 1½ hrs/week Family workshop: approx. 7 hrs, 4 per year Year 2 Center: 12 hrs/week Language class (English): 2½ hrs/week Evening meetings: 4 hrs/month	6 hrs/week Evening meetings: 6 hrs/month
Support services Medical	Pediatric clinic at the center once a month Pediatric nurse practitioner did screening and gave emergency help	Annual physical exam for child and follow-up Pediatric nurse available for consultation, emergency help, and home visits	Full medical services for family based on evaluation of population and community resources; complete clinic services for mother and children in family aged 12 or under

TABLE 3.1--CONTINUED

Program Feature	Birmingham PCDC	Houston PCDC	New Orleans PCDC
Support services			
Meals	Breakfast, lunch, and afternoon snack	Center program: midmorning snack and lunch	Midmorning snack
Social services	Emergency aid and referral	Consultation with community worker and referral	Consultation and referral with MSW
Transportation (to center and center-sponsored events)	For participants in first two stages of participation	Mothers and children in center program	Mothers and children
Clothing	Provided for children while at center	Not provided	Not provided
Sibling program	For siblings 1 mo-6 yrs	Center program: for siblings, birth to 5 yrs	For siblings, 1 mo-6 yrs
Stipends for mothers	$5 to $14/day for program mothers, amount increased with length of participation and added responsibilities	$3/day for mothers in center program only	$5/day for program mothers

TABLE 3.1--CONTINUED

Program Feature	Birmingham PCDC	Houston PCDC	New Orleans PCDC
Staff composition	Small professional staff; program mothers serve as temporary paraprofessional staff during last phase of their participation in program	Bilingual professional and paraprofessional	Professional and paraprofessional
Ethnic background	Ethnically mixed	Predominantly same ethnic background as participating mothers	Predominantly same ethnic background as participating mothers

BIRMINGHAM PCDC PROGRAM

The participants in the Birmingham program were both black and white families, more than half of which were female-headed or extended-family households. The program structure emphasized increasing responsibility for mothers, including learning through teaching their peers.

The term of the center-based program was 31 to 33 months. Mothers entered the program when their children were 3 to 5 months old and remained until they were 3 years. Mothers' attendance increased in the course of the program. During the first year, they spent 3 half-days per week at the center. Parenting and child development were the subject matter in this first stage of the program. The mothers looked after their own children in a nursery setting, where the teaching mothers explained, demonstrated, and encouraged a variety of mother-child interactions. This was supplemented by manuals, by videotaping and related discussions, and by question-and-answer sessions with the center's nurse.

During the second or transition stage of the Birmingham program, which began when the children were approximately 15 months old, the mothers spent 4 half-days per week as understudies to the teaching mothers in the nurseries, and a fifth day in training classes conducted by permanent staff members and the teaching mothers. Topics covered in the training sessions included health, social services, child development, adult growth, observation and supervision, and planning activities for the children.

When the children were between 18 and 30 months old, mothers could enter the third stage of participation, attending the center 5 full days per week. Four mornings were spent as teaching mothers, with primary responsibility for conducting the children's program and teaching other mothers. The afternoons and 1 full day were spent in such activities as training sessions, workshops, sessions with their own children, class preparation, and social gatherings.

The training sessions covered child development, adult growth, interviewing skills, classroom management, evaluation skills, health education, social services, music, and art. In the rare instance when a participant did not assume teaching responsibilities, she maintained a schedule of 5 half-days per week until graduation.

The children's program was closely tied to the adult program because the children were in the nurseries with their own or other teaching mothers. The children were grouped according to age: 3 to 5 months, 6 to 17 months, 18 to 36 months, and the preschool sibling group aged 3 to 6 years. The program experiences for the children included planned, age-appropriate activities for the older children as well as time for free play. All the basic child care, snacks, and lunch were provided to children by their own mothers or by teaching mothers.

Support services for the mothers and children included transportation (during the first two stages only); breakfast, lunch, and afternoon snack; routine physical exams, immunizations, and sick-baby care; a program for siblings, and a daily stipend ranging from $5 to $14. In the final stage, the mothers were responsible for their own transportation, and the stipend was increased to reflect their added involvement and responsibilities.

The Birmingham PCDC's permanent professional staff was small because the teaching mothers served as paraprofessionals for up to 18 months during their last stage of participation. Some program graduates were also employed as paraprofessionals.

HOUSTON PCDC PROGRAM

The Houston PCDC program was developed in response to specific needs articulated by its Mexican-American population in a preliminary survey.

Program developers incorporated a home visit element, the engagement of fathers and other family members, and bilingual development as important aspects of the design.

The 24-month Houston program was home-based for the first year, and center-based for the second. Mothers entered when their children were 1 year old. During the first year, there were about 30 weekly home visits, each lasting about 1½ hours. In addition, there were four weekend workshops for the entire family, and optional English language classes were offered weekly. During the second year of the program, mothers attended 3-hour sessions at the center 4 mornings a week for 8 months, and both parents attended evening meetings twice a month.

Trained paraprofessionals made the home visits during the first year, exchanging information with mothers about child development, parenting skills, and the use of the home as a learning environment. Part of each visit was a lesson in a new activity involving a book or a toy and discussion of specific aspects of child development. The home visitor was alert to other interests or needs that the mothers expressed. The four family workshops focused on such topics as communication, decision making, problem solving, and family roles.

During the second year, mothers divided their time at the center between sessions on home management activities and sessions on child development and parenting. English classes also were available. Discussions of cultural values and traditions were interspersed throughout. The child development sessions consisted of time in the children's classroom and discussions apart from the children. In the classroom, children followed a formal curriculum, and the interaction of mother-child pairs was videotaped. In small groups, the mothers critiqued these tapes and discussed in detail a variety of issues about child behavior and development. The topics in the family life and home management sessions included health, language, nutrition, clothing care and construction, consumerism, use of community resources, optional courses in driver education and home decorating, as well as bilingual language classes in English and Spanish.

There was no separate program for children in the first year because mothers and children received home visits. In the second year, the children attended the center's nursery school, which was a laboratory-type program staffed by trained paraprofessionals, 4 days per week. The mothers spent some of their center time in the nursery school with the children during the 8-month period.

Support services during the first year were limited to home visits by the center nurse and community workers. Services were expanded during the second year to include transportation, lunch, sibling care, a daily stipend of $3, and health and social services. A nurse was available at the center for first aid and consultation, and the program children received annual physical examinations in a community clinic. Social services took the form of referrals to community resources such as legal aid, housing assistance, and the Food Stamp Program. The health and social service staffs emphasized the need for families to seek the required services on their own in the future.

The staff consisted of professionals and paraprofessionals. Although the latter lacked formal early childhood or child development education, they were specially trained for their roles in the PCDC program. All staff members spoke Spanish and English fluently. The fact that staff members were drawn primarily from the community increased the likelihood that they would relate to the families as peers and contribute to the program through their understanding of the participants' special bilingual/bicultural needs.

NEW ORLEANS PCDC PROGRAM

The New Orleans PCDC served low-income black families, which constituted more than 90% of the inner-city population. This program featured a strong preventive health and health education component, because the community's health care resources did not meet the needs of its residents.

The program was center-based and ran for 34 months, beginning when the children were 2 months old and ending at 3 years of age. Throughout their participation, mothers attended the program 2 mornings per week for 3 hours. In addition, Parent Advisory Council meetings were held once a month for 3 hours. Family members attended special events planned by the mothers.

One of the weekly sessions was concerned with child development and the participants' roles as parents; the other, with adults and their relationships within the family and the community at large. The child development component included a 1-hour discussion group and a 2-hour parent-child laboratory experience. The discussion group covered topics such as how infants and children learn from their environments, language acquisition, social and personality development, and curiosity and exploration. Specific, everyday child-rearing concerns were the basis of all discussions.

The parent-child laboratory was coordinated with the discussion sequence so that mothers could observe the stages and behaviors they had discussed. Educators engaged in frequent one-to-one conversations with the mothers as situations presented themselves in the laboratory. The main purpose of the laboratory experience was to enable mothers to enjoy playing with and teaching their children. Demonstration of structured activities that mothers could use with children at home was one vehicle used to promote mother-child interaction.

The content areas in the adult and family life component included maternal and child health education and parent activities and home resource education. In addition, there were discussions about the use of community resources and local political and social concerns. Finally, there was emphasis on adult development, self-awareness, and interpersonal skills.

The program for the children took place in laboratories grouped by ages as follows: 2-11 months, 12-23 months, 24-36 months, and the preschool lab for 3- to 6-year-old siblings. Each laboratory was staffed by two paraprofessional educators. Children, like their mothers, were at the center 6 hours per week for 3 years. Their mothers joined them in the laboratories for 2 hours each week; the remaining 4 hours were filled by basic child care and standard age-appropriate activities.

The center provided transportation, a morning snack, a daily stipend of $5, and a program for preschool-aged siblings. Extensive health services were provided to the mothers and their children under age 12. The center nurse gave all immunizations, vitamins, and prescribed medicines, treated minor illnesses and emergencies, and arranged preventive health screenings for such illnesses as sickle cell anemia and lead poisoning. The center also made available to participating families the services of a local pediatrician and paid for most medical referrals such as orthopedic services and dental care. In addition, the center nurse served as health counselor to individual families. A traditional range of social services was provided by the center's social worker. Although these professional services were always available, the emphasis was on helping mothers cope with problems themselves in the future.

The educational and supportive services were delivered primarily by a staff of program-trained paraprofessional educators from the community. The basic criterion for selecting educators was that their background and cultural experience be similar to that of the participants. There was a small professional staff of educators, a social worker, and health professionals, who served predominantly as resource persons and facilitators for parents and paraprofessionals.

Chapter 4

Evaluation Strategy and Design

The PCDC evaluation strategy was developed at the onset of the project in 1970. All of the evaluation data collected from 1972-1980 and reported here follow the original design. Initially developed as a five-year research strategy, consisting of three individual, on-site evaluations, the initial design was to be followed by a second five-year phase, an externally contracted uniform evaluation. When funds for the second phase were not available, the original design of three separate evaluations was extended for the remainder of the PCDC project. (See also Chapter 2, Overview and History of the PCDC Project).

While the three original evaluations were to be independent, they also were to include some common characteristics:

1. Use of a broad range of outcome measures tied to program goals, including maternal interview data, videotaped observations of mothers interacting with their children, and child tests, both standardized and nonstandardized.
2. Data collection at multiple time points, including: baseline data at program entry, testing throughout the time of program attendance, and at graduation, and annual follow-up of graduated mother-child pairs as resources permitted.
3. "Marker" variables to be used across all three sites. In order to retain some data comparability, several child tests were administered across all three sites: the Bayley Infant Development Index, the Stanford-Binet, and Palmer's Concept Familiarity

Index. All three sites were also directed to collect baseline demographic data and videotaped mother-child interaction observations; however, content differed among sites;

4. Random assignment of all mothers and children to program and control groups;
5. Concentration on evaluation of each intervention program as a whole rather than attempting to assess impact of separate components within a program.
6. Thorough documentation of the program model being evaluated.

This PCDC evaluation strategy included methodological features that, although routine in laboratory research, were uncommon in field-based research at the time:

1. Comparison of randomly assigned program and control groups;
2. Collection of baseline data to be used in program and control group comparisons for initial equivalency and possible differential attrition over time;
3. Collection of longitudinal data at multiple time points examined for timing and patterning of effects during the program, as well as at graduation from the program;
4. Evaluation data collected for several successive annual cohorts in each site, to determine stability of effects as programs evolved from initial innovative stages to offering established services.

Measurement Considerations

The goal of the PCDC project was to involve the mother or primary care-giver in a program of educational and supportive services, in order to enhance the child's development both during the program years and after. Each of the PCDC programs presented many potential areas for evaluation: effects on the mother's child-rearing; effects on the mother's functioning as an adult, aside from child-rearing; effects on the cognitive and social development of the program child; effects on the family and the family's interactions with the community.

Each potential evaluation area was substantial and complex, posing methodological and technical problems. In a paper suggesting measures to be used in evaluating the effectiveness of the PCDC's, Hoffman (1969) pointed out that in most potential areas of PCDC impact, appropriate, carefully constructed measures of known reliability and validity were not then available.

It was decided to concentrate evaluation resources on the most direct program goals: the mother's interaction with her child, and the child's cognitive development. Although all three PCDCs concentrated their main evaluation efforts on the child and mother-child interactions, individual PCDCs also addressed other areas.

Mother-Child Interaction Observations

Each program developed its own observation situations and coding schemes. This independent instrument development was encouraged for several reasons. There was little precedent for using direct observation of mother-child intervention to evaluate program effectiveness; in fact, at the beginning of the project there were no readily available mother-child interaction instruments that spanned the ages of the PCDC children and included the kinds of maternal variables the PCDCs were designed to impact. It was feared that a common observation instrument might not be sensitive to the differences in program populations or differences in emphasis and structure in the developing programs. Furthermore, it was hoped that independent work would lead to a more diversified evaluation. Although this approach drained resources that might have supported additional instrument construction in other areas, the investment was considered worthwhile. The mother-child focus was highly relevant both to program goals and to the burgeoning interest in the mother's role in infant and child development.

Mother-child interaction observation settings. In 1970, and even now, there was little data about the comparative validity of observational settings. Home observations, while theoretically preferable, presented practical problems such as invasion into the home, impracticability of conducting home observations on the large number of subjects involved, and fear in at least one site about entering some of the target neighborhoods with expensive observational equipment. Hence, it was decided to have a structured teaching situation and a waiting room observation that could be administered under controlled conditions at the testing center. The structured teaching situation had been used with older children by Hess and Shipman (1968); the waiting room setting had been previously used profitably with infants.

Each PCDC designed its own mother-child interaction assessment. Houston chose a laboratory based teaching situation with one free-play component, the Maternal Interaction Structured Situation (MISS), augmented by administration of Caldwell's (1970) Home Observation for Measurement of the Environment (HOME), a relatively simple checklist. Birmingham selected several different center-based observations: a "waiting room" situation, a structured teaching situation, and a moderately stressful situation.

New Orleans selected a waiting room situation and a structured teaching situation.

If the interaction assessments were conducted in the center, the program mothers would have an unfair advantage because they would be in familiar surroundings, whereas the control mothers were in a new setting. All three PCDCs attempted to control for this extra familiarity by having a separate building or section of a building for the research.

Birmingham mother-child interaction observations. Two observations were used, the waiting room and the teaching situation. They were videotaped sequentially in the same setting at 24, 36, and 48 months. The setting was a 12 X 14 foot room furnished with a comfortable adult-sized chair in one corner, a set of shelves along one wall stocked with toys, an inflated punching toy, a child-sized chair, and a small table with adult magazines on it. In the corner opposite the mother's chair, a videotape camera was mounted at a height of about 8 feet.

At the outset, the tester asked the mother and child to make themselves at home for a short time and then left the room. The following 6 minutes of free play were videotaped to be scored later by trained coders.

The tester returned and took the child from the room while another tester gave the mother three sets of three objects each. She instructed the mother how to sort them by shape and color and asked her to teach her child to sort the objects. For the 24-month observation, plastic spoons, small metal cars, and wooden dollhouse chairs of different colors were used; for the 36- and 48-month sessions, half-inch plastic letters "T", "W", and "O". The second tester returned the child to the mother and left, and the following 6 minutes of interaction were videotaped for later coding.

Coding procedures--waiting room. The two 6-minute segments were divided into 15-second units for coding. The presence/absence of each of these maternal behaviors was scored for each unit of the free play observation: active participation in the child's activity, shows affection, gives praise, carries on general conversation, gives information, labels, facilitates child's activity, uses suggestions, commands, also questions, touches child, holds child, plays with child, talks in controlling and noncontrolling manner, smiles at child, looks at child, looks around room.

Coding procedures--teaching situation. Five 5-point rating scales were used to score maternal behavior in the teaching situation. Each of the following ratings were made at the end of each minute of the 6-minute teaching task (except pace which was rated only once at the end): quantity and timing of instructions, use of praise, encouragement, questions vs. orders, and pace.

Houston Maternal Interaction Structured Situation (MISS). Videotaped samples of mother-child interaction in five structured tasks were obtained when the child was 12, 24, and 36 months of age. The setting was an 8 x 15 foot room furnished with a child's table and two small chairs, a toy bench with a seat back and cushion, and a toy cabinet. The interaction was videotaped from behind a one-way mirror at one end of the room.

The procedure at age 2 required 28 minutes, and consisted of a book task (4 min.), animal sort (4 min.), block sort (4 min.), play village (8 min.), and free play (8 min.). At age 3, the MISS required 56 minutes and two sessions were necessary. The first consisted of free play (20 min.). The second consisted of the book task (6 min.), block sort (12 min.), block design (6 min.), and teaching toys (12 min.). Abbreviated instructions for each task are as follows: book: help the child learn something by reading the book together; sort: teach the child to sort animals (24 months), to sort blocks first by color, then by size, then by color and size (36 months); block design: teach the child to reproduce a model (4 block, rectangle at 24 months, 7 block zig-zag at 36 months); play village: help the child learn at play together with model town square with toy vehicles and people; free play: play just as would at home.

MISS coding procedures. Six scales were used to rate each 1-minute videotape segment. The six scales were mother's affectionateness (9-point scale), use of praise (5-point scale), use of criticism (5-point scale), control of the child's behavior (5-point scale), encouragement of the child's verbalizations (5-point scale), and use of reasoning (5-point scale). The scoring procedure yielded ratings on each scale, for each minute of the observation of each task. The ratings were averaged for each scale and task. Research conducted in Houston indicated that the five tasks all tapped a single dimension. Therefore, the ratings for each scale were averaged across all five tasks.

Houston Home Observation for the Measurement of the Environment (HOME). The HOME, used at 12, 24, and 36 months, was developed by Caldwell (1970). The mother and child were visited at home for an interview and observation period of 1 to 1 1/2 hrs. The interviewer recorded the presence or absence of 45 maternal behaviors and characteristics of the home observed by the interviewer or reported by the mother. These items were categorized in six subscales and were summed for a total

HOME score. The six subscales were: emotional and verbal responsiveness of mother; avoidance of restriction and punishment; organization of environment; provision of appropriate play materials; maternal involvement with child; and opportunities for variety in daily routine.

New Orleans Mother-Child Interaction observation schedule (MCI). The MCI is a waiting room observation used at 2, 12, 24, 36, and 48 months. The MCI observations were made at the PCDC during the same testing appointment at which the regular battery of child tests was given. The mother and child were asked to enter the testing room and wait for a short time before the child was tested. The observation was videotaped during this waiting period. Mothers were informed that they were being observed with their children, but were given no specific instructions.

The observation setting was a room 9 x 12 feet; a one-way mirror was located in one wall, and a camera and microphone were positioned near the ceiling. One room contained a comfortable armchair, a table with magazines, a child-sized table and chairs, and bookshelves filled with toys. There was a closed, heavy wooden toychest in the room, in which some toys were stored. The interaction was videotaped using a videorecorder located behind the one-way mirror. For the first cohorts, the observation lasted 6 minutes; for all successive cohorts, 10 minutes. Sound markers marked 15 second intervals on the tape.

Coding procedure--New Orleans waiting room. The maternal behaviors were coded in two ways: frequency counts of presence or absence of selected behaviors in each 15 second unit, and global rating scales applied to the total observation. The behaviors coded according to frequency of occurrence were categorized into one of 6 variable clusters. These included: Positive Language (reading, labelling, explaining or exchanging information, elaboration or extension, verbal stimulation, gives permission, expresses appreciation, praises, imitation, general conversation, asking questions); Directive Language (focusing, suggesting, commanding, correcting, distorting); Restrictive and Negative Language (restriction, criticism or hostility, threats or warning); Positive Techniques (positive language plus active participation, teaching or demonstration, facilitation, physical affection, holding, physical stimulation of infant); Directive Techniques (Directive language plus non-verbal directive behavior); Restrictive and Negative Techniques (Restrictive language plus physical restriction, physical punishment, or ignoring a child's bid for response).

Each of the 6 variable clusters received a percentage score based on the frequency of units in which the relevant variables were observed, divided by the total number of units of observation (for Technique Clusters) or by the total number of units in which the mother used language (Language Clusters).

The three global rating scales were adapted from Ainsworth (1971), and were used at the end of the frequency coding to provide summative information and add a qualitative dimension to the unit by unit frequency coding. The three 9-point rating scales were: Insensitivity--Sensitivity, Rejection--Acceptance, Interference--Cooperation.

New Orleans structured teaching observation. The setting was the same room used for the New Orleans waiting room observation; the teaching observation was videotaped at a separate session at 36 months. Both the teaching task and the coding were the same as the Birmingham teaching situation.

Child Tests

A major concern from the beginning of the PCDCs was the child's general intellectual functioning. The Stanford-Binet was selected because it was available, had known reliability, some predictability, offered the possibility of comparability with other research, and was a widely used rough indicator of general intellectual status. Criticisms of the Binet as culturally biased and overly narrow in scope were considered; it was not intended to be the sole measure of cognitive impact. Several additional experimental cognitive measures were selected. The Concept Familiarity Index (Palmer, 1970) was developed for use with nonverbal, low-income children. It assesses basic concept attainment, and was used in all 3 sites. The New Orleans site also used the Meyers Pacific Test Series (Shapiro, 1970), also a nonverbal measure, heavily weighted toward perceptual and abstract abilities.

All three PCDCs used the Bayley Scales; as with the Stanford-Binet, it was a known, available measure of development at 24 months and below.

Other areas of intended impact. The three PCDCs experimented with measures in several other areas of intended impact: infant development measures, child social and affective variables, maternal attitude measures in areas of motivation, self-esteem, locus of control, etc. Much of this experimentation was limited only to one or two cohorts, or involved measures of questionable reliability which were changed or refined over several cohorts. For the present report, most of these experimental measures with small samples or questionable reliability have been omitted.

Cross-site comparisons. Direct cross-site comparisons should not be made with the present PCDC data. Across-site variation in the psychometric properties of the measures is present not only in the mother-child interaction observation instruments, but also should be considered with child test results. Each site trained and supervised its own paraprofessional testers. Although *within-site reliability was high, variations across sites are possible,* especially in Houston, where all tests were administered either in Spanish or English, depending on the language preference of the mother or child.

Recruitment, Random Assignment, and Sample Identification

Recruitment and random assignment procedures varied slightly between sites, and for cohorts within sites.

Birmingham. A total of 107 mother-child pairs completed data collection at 36 months in the program group; 79 completed data collection in the central group. These numbers represent participants who entered the program after January 1972, and who graduated before October 1980. Participants prior to January 1972 are not included, as they were part of the pilot effort, not randomly assigned, and began the program at an older age than later experimental children.

Half of the Birmingham participants were recruited through door-to-door canvassing of low-income neighborhoods; the other half were referred from community agencies or volunteered after hearing about the program from friends or relatives. Mothers and infants with severe abnormalities were not accepted. Infants had to be between age 3-5 months; mother-child pairs remained in the program until the child was 36 months of age.

Birmingham participants came from very low-income black and white families. An important essential feature of the Birmingham program model was a socially integrated participant population. Unfortunately, it was more difficult to recruit white than black participants; all white participants were therefore assigned to the program group. All black participants were randomly assigned to either the program or control groups after agreeing to participate in either group. Control group participants were offerred no special services but did receive a small stipend for each complete testing appointment.

It is not possible to identify distinct cohorts of participants in Birmingham. In order to maintain a smooth progression of participants through the several levels of responsibility in the Birmingham program, new mothers were recruited continuously. Each month a few mothers entered and a few graduated. (See Appendix A for a discussion of the post hoc cohort designations used in Birmingham.)

Houston. All participants began the program when the child was 12 months old and graduated when the child reached 36 months. Each year a new cohort of families was recruited and randomly assigned to the program or control groups. Data were collected on all families at entry and when the child was 24 and 36 months of age.

A total of 102 mother-child pairs completed data collection in the program group, and 98 mother-child pairs completed data collection in the control group. Data from all mother-child pairs who began the program by

1972 and graduated by October 1980 are included in this report. Earlier cohorts were recruited as part of a pilot program in Houston, but are not included here as both the evaluation measures used and the program implementation differed from later practices.

Families were recruited by door-to-door canvassing of homes in low-income Mexican-American neighborhoods in Houston, Texas. Infants or mothers with severe abnormalities were excluded. For the 1972 and 1973 cohorts, eligible families were randomly assigned to one of the two groups and then invited to participate in that group. After 1974, families were assigned to either program or control groups after agreeing to participate in either group. A stipend was paid to all families on completion of each test battery.

New Orleans. New Orleans participants were black mothers and children living in the inner city. Mother and child pairs entered the program when the child reached 36 months of age. Each year a new cohort of mother-child pairs was recruited. A total of 46 mother-child pairs in the program completed data collection at 36 months; 52 mother-child pairs in the control group completed data collection at 36 months. Data included in this report begin with the second cohort, recruited in 1972. As in the other sites, data from the pilot cohort are omitted because of differences in both evaluation and program experience. (See Appendix A for a more complete discussion.)

Birth records at a large publicly funded hospital, Charity Hospital in New Orleans, were the primary means for identifying potential recruits.

The birth records of all potential participants were screened for evidence of normal pregnancy, infant birth weight, and other neurological indicators of normal infant health. Mothers between the ages of 17 and 35 years were eligible. Mother-child pairs were assigned to program or control groups after agreeing to participate in either group.

Data Collection

Each evaluation attempted to make the participants comfortable in the research setting by adapting measures and testers to the language, culture, and backgrounds of the participants. Testers spoke the same "language" as the participants and were usually from the same community. In Houston, mothers and children had a choice of responding in Spanish or English, depending on the language with which they were most comfortable. Formal child tests were not administered until a child was at ease and responsive to the examiner, even if this meant rescheduling a session.

Quality control of testing was maintained by making intertester and interscorer reliability checks. The videotaped interaction observations were, in addition, coded by scorers unaware of the group assignments of the subjects.

Data collection schedules varied among the 3 sites, from annually in Houston, to several times a year for the first few years in New Orleans and Birmingham. As available research funds were reduced, testing also became less frequent in New Orleans and Birmingham. This report focuses on annual test data. Data from intermediate test points is reported only if it suggests results that are disparate, or add information to the annual testing results.

Follow-Up Testing

As funds were available, each PCDC followed up some of the mother and child participants beyond graduation. Reported here are intelligence test scores at 48 and 60 months in all 3 sites; mother-child interaction data and follow-up questionnaires in New Orleans and Birmingham at 48 months; and a modest amount of data from school records for the oldest cohorts in Birmingham and New Orleans.

Chapter 5

Short-Term Impact

This chapter provides evidence of the effects of PCDC participation on mothers and target children at the time of graduation from the PCDC (child age 36 months). Four major categories of analysis are presented. First, the problem of possible differential attrition is addressed. Next, impacts of the program on target children are presented. Third, evidence of program impact on mothers is provided. Finally, a short section relating attendance to background and outcome variables is included.

Many of the analyses in this section parallel analyses previously reported in the reports from each center completed in 1975 at the end of the first five years of PCDC operations. The current report includes data collected through September of 1980. In addition, some new scores were created by different combinations of individual scores. Analyses were run separately for each cohort.* Although the apparent strength of effects differed somewhat from one cohort to another, a series of cohort by group analyses of variance indicated that there was no evidence that the post-1975 results were significantly stronger or weaker than the pre-1975 results. Therefore, all analyses presented in this section contain data combined across cohorts. Results of the separate cohort analyses are presented in Appendix A.

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*Yearly cohort designations were used in Houston and New Orleans. Birmingham data did not contain cohort designations because of the "trickle" recruitment model used there. In this model, mothers were recruited and entered the program continuously during the year rather than a group of mothers starting together at the same time. For analysis purposes, artificial cohort designations were created in which mothers and children entering the program in two adjacent calendar years were placed in the same cohort.

The sections on mother and child effects also include discussion of the possible impact of various moderator variables intended to determine whether the PCDCs were more effective for families with certain background characteristics (e.g., relatively uneducated mothers or absent fathers). In order to determine the direct and interactive effects of the background variables, multiple regressions were run in which the background variables were entered into the equation along with a dummy variable for treatment. As a minimum, these background factors include the child's sex, mother's age, mother's education, and number of children in the family. Other additional variables were used in specific sites. For example, father presence was used in Birmingham and New Orleans, but was not a useful variable for Houston because the father was present in nearly all families there. Rooms per person was used as a variable in Houston because preliminary analyses showed it was related to some outcome variables in that site, although it was not related to outcome in the other sites. Given the relatively small sample sizes, it was important to keep the number of independent variables to a minimum in order to ensure meaningful interpretation of the regression weights.

Product terms (i.e, the background variable times the treatment variable) were then added to the regression equations to determine whether including that interaction term would contribute significantly to the prediction of the dependent variable. Each interaction term was tested seprarately; all independent variables were included in the equation with each interaction term, but the other interaction terms were excluded. This kept the number of variables in the equation at any one time to a reasonable number, and simplified interpretation of the interactions.

(See Kerlinger and Pedhazur, 1973, for a discussion of the assessment of interactions with product terms in multiple regressions).

In preliminary analyses, regression residuals were plotted against the original background scores to check for possible nonlinear regressions. Nonlinearity was not noted, and all subsequent analyses assumed a linear model.

Readers accustomed to a conventional analysis of covariance approach should note that the squared t-value associated with the treatment regression weight is exactly identical to the F-value in an analysis of covariance that tests for the significance of the treatment after controlling for the effects of all the background variables.

Attrition Analysis

True random assignment procedures provided the best possible protection against systematic bias in the initial sample selection process. However, differential attrition from program and control groups could yield biased comparisons at the time of graduation from the program. Selected demographic characteristics and any appropriate test scores at the time of entry into the program were compared for program and control children who were still left in the sample when the graduation (36-month) test battery was administered. This final sample was defined by having a score on the 36-month test for which data was most complete. In Birmingham and New Orleans the most complete measure was the Stanford-Binet, while in Houston it was the HOME Inventory. The Houston Stanford-Binet sample was practically identical to the HOME Inventory sample. The differences between program and control groups in the final sample were tested with t-tests for the continuous variables and chi-squares for the dichotomous variables. For comparison purposes, entry scores from program and control families that dropped out are also included in the following tables. The tables also provide a summary demographic description of the sample.

Birmingham attrition analysis. Results of the Birmingham attrition analysis are presented in Table 5.1. The only significant difference between the groups was on the 4-month Bayley Mental Development Index (MDI). This suggests the possibility that mothers of less cognitively competent children were more likely to drop out of the program group and remain in the control group. However, at least two important factors make this interpretation questionable. First, the 4-month Bayley is more of a reactivity measure than an assessment of cognitive competence. It has a very low correlation with later MDI scores; its correlation with the 10-month MDI is .09 (N=175) and with the 22-month MDI the correlation is .13 (N=164). The correlation of the 4-month MDI with 36-month Stanford-Binet IQ scores is .19 (N=155) and .10 (N=142) with the 48-month Binet. By contrast, the 22-month Bayley correlates .56 (N=169) with the 36-month Binet and .43 (N=140) with the 48-month Binet. A second factor is that the 4-month Bayley is not, strictly speaking, a pretest measure. Program participants attended the center for about one month before this test was administered. Although this is too short a time to expect a true program effect, it might be long enough to make a difference in how comfortable the infant felt about being taken from its home and exposed to strangers.

TABLE 5.1

Birmingham

Attrition Analysis for Stanford-Binet Scores

36 months

		Drop		Final Sample		
		Program	Control	Program	Control	t
Income[1] Per person	N	66	35	100	74	
	M	1075.98	968.99	912.73	889.44	.24
	SD	719.94	756.52	579.78	679.22	
Mother's Education	N	71	37	106	77	
	M	10.90	11.05	11.01	11.09	-.37
	SD	1.63	1.33	1.52	1.44	
Number of Children in Family[2]	N	72	37	106	77	
	M	.83	.94	.99	1.13	-.37
	SD	1.09	1.00	1.32	1.22	
Mother's Age	N	72	36	106	77	
	M	21.29	21.76	21.78	22.25	-.68
	SD	4.60	4.10	4.65	4.59	
Bayley Mental Development Index (4 mo)	N	115	42	81	74	
	M	108.84	113.67	112.52	106.15	2.80*
	SD	16.37	13.42	14.30	13.96	
						chi-square
Father Present	N(%)	17(23.6)	7(19.4)	33(31.1)	32(41.6)	2.12
Father Absent	N	55	29	73	45	
Male	N(%)	83(51.9)	49(47.1)	50(46.7)	46(58.2)	2.41
Female	N	77	55	57	33	
TOTAL		160	104	107	79	

*p<.05

[1] Income per person figures obtained over several cohorts were converted to constant 1967 dollars by the Consumer Price Index.

[2] Number excludes target child.

Houston attrition analysis. Results of the Houston attrition analysis are presented in Table 5.2. Because the Houston program did not begin until the target child was twelve months of age, the 12-month Bayley MDI and 12-month HOME Inventory scores are true pretest measures. Father absence was not considered as a significant demographic variable in Houston because a father was present in 94% of the Houston families. Income information from Houston was not available for later cohorts. Previously reported Houston data for the first two experimental cohorts indicated no differential attrition on income per person (Johnson, Kahn, & Leler, 1976). The N is low for the MDI because it was not administered in the last three yearly cohorts. There was no evidence of differential attrition on any of the Houston scores. Note also that, on the average, Houston mothers had less formal education than mothers in Birmingham or New Orleans (see Table 5.3), but were somewhat older.

New Orleans attrition analysis. New Orleans attrition results are presented in Table 5.3. The only variable on which there were significant program-control differences was income per person. Per person income was higher in the control group. Although this might be expected to bias analyses against finding program effects, income per person may not be a very meaningful variable on this poverty level sample with a restricted range of incomes. Reports from the testers indicated that they were frequently skeptical of the accuracy of the income information provided. Even if income information were accurate, it is difficult to assess the

TABLE 5.2

Houston

Attrition Analysis - HOME Scores
36 months

		Drop		Final Sample		
		Program	Control	Program	Control	
Mother's Education	N	162	181	82	95	
	M	7.08	6.68	6.52	7.03	-1.08
	SD	2.93	2.77	3.34	2.91	
Number of Children in Family [1]	N	160	181	91	104	
	M	2.11	1.94	1.84	1.96	-.50
	SD	2.23	1.95	1.51	1.93	
Mother's Age	N	165	183	92	98	
	M	26.26	26.92	27.92	27.38	.64
	SD	6.27	6.21	5.86	6.17	
Bayley Mental Development Index (12 mo)	N	96	103	48	69	
	M	105.90	105.75	104.38	102.62	.90
	SD	12.09	13.03	10.54	10.30	
HOME [2] Total (12 month)	N	176	190	91	104	
	M	28.68	29.29	28.81	29.36	-.56
	SD	6.36	6.41	6.87	6.76	
Male	N(%)	112 (57%)	112 (51%)	45 (45.4)	57 (52.3)	chi-square 2.12
Female	N	83	104	54	52	
TOTAL		195	216	99	109	

[1] Excluding target child

[2] Home Observation for the Measurement of the Environment

TABLE 5.3

New Orleans

Attrition Analysis - Stanford-Binet

36 months

		Drop		Final Sample		
		Program	Control	Program	Control	t
Income per Person[1]	N	81	58	42	49	
	M	590.20	552.00	530.36	777.34	-2.40*
	SD	623.38	490.95	360.38	578.72	
Mother's Education	N	83	65	42	50	
	M	11.08	11.09	11.14	11.24	- .28
	SD	1.80	1.74	1.60	1.69	
Number of Children in Family[2]	N	84	65	43	50	
	M	1.12	1.40	1.26	1.46	- .76
	SD	1.16	1.36	1.26	1.33	
Mother's Age	N	74	62	41	46	
	M	22.92	22.06	23.81	23.28	.42
	SD	3.55	4.52	6.81	4.66	
Bayley Mental Development Index (6 mo)	N	33	34	35	42	
	M	119.67	120.06	127.40	133.41	1.47
	SD	18.29	17.31	14.38	15.16	
						chi-square
Father present	N (%)	20 (23.8)	18 (27.7)	12 (27.9)	19 (38.0)	1.06
Father absent	N	64	47	31	31	
Male	N (%)	62 (53.0)	43 (53.1)	24 (52.2)	24 (46.2)	.35
Female	N	55	38	22	28	
TOTAL		117	81	46	52	

*p<.05

[1] Income per person figures obtained over several cohorts were converted to constant 1967 dollars by the Consumer Price Index.

[2] Number excludes target child.

economic impact of other factors not counted as income (e.g., food stamps) that might benefit relatively low-income families more than relatively high-income families. The income per person variable was not correlated with later cognitive outcomes. Its correlation with 36-month Stanford-Binet IQ scores was .02 (N=91), and it had a negative correlation with 48-month Binet IQ ($\underline{r}$ = -.14; N=64).

Conclusions. Out of twenty comparisons, only two yielded "significant" results; one of these differences favored the program group and the other favored the control group. In summary, there was no evidence that the final samples were systematically biased.

Child Effects

Stanford-Binet. The Stanford-Binet Intelligence Scale was used in all three sites as a measure of general cognitive functioning. Although the cognitive skills assessed on this test generally were not directly instructed in the PCDCs, it was hoped that the activities of mothers and children in the Centers would generalize to this global measure of intellectual ability.

As indicated in Table 5.1, all three programs demonstrated significant IQ effects at the time of graduation from the program. Note that the IQs are reported on the basis of the 1960 norms. The 1960 norms were used in order to maintain continuity with earlier PCDC reports and to facilitate comparisons to previous evaluations (e.g., longitudinal consortium) which used the 1960 norms. At this age level, scores are about 10 points lower on the 1972 norms.

The regressions of the background variables on the Stanford-Binet are presented in Table 5.5.

In general, the lack of relationship of these variables to IQ score seems more striking than the significant effects that are noted. A major factor in this lack of relationship is undoubtedly the relative homogeneity of the samples, which tends to attenuate relationships. Thus, for example, mother's education in New Orleans would doubtless contribute significantly to the prediction if the sample included all mothers in the city, not a sample of black mothers in the central city who met certain income guidelines. In the current sample, the mean number of years of mothers' education was 11.2 with a standard deviation of only 1.6.

Of the 17 background variable by treatment interactions that were tested, only one (rooms per person X treatment in Houston) was significant. This finding was in the direction suggesting that the treatment was more effective for children who came from relatively uncrowded homes. However, this finding was not replicated for other outcome variables in the Houston graduation battery (Concept Familiarity Index, HOME, and Maternal Interaction Structured Situation) or in the 24-month Bayley Mental Development Index scores, and may be best explained by chance.

Concept Familiarity Index. Results on Francis Palmer's Concept Familiarity Index (CFI) are presented in Table 5.3. Although the program children had higher scores in all three sites, differences were statistically significant only in New Orleans. The failure to find significant differences

TABLE 5.4

Stanford-Binet (1960 norms)

36 months

Site		Program	Control	t
	N	107	79	
Birmingham	M	97.65	91.49	3.75**
	SD	10.38	11.99	
	N	102	98	
Houston	M	107.26	103.41	2.09*
	SD	13.07	12.96	
	N	46	52	
New Orleans	M	104.22	96.69	3.27**
	SD	10.36	12.20	

*p<.05
**p<.01

TABLE 5.5

Regressions of Background Variables - Stanford-Binet IQ

36 months

Independent Variables	Birmingham (df=165)		Houston (df=141)		New Orleans (df=73)	
	Weight	t	Weight	t	Weight	t
(1) Child's sex[1]	1.99	1.21	3.48	1.70	3.18	1.31
(2) Mom Education	1.36	2.06*	-.01	-.04	-.37	-.46
(3) Mom age	.19	.61	.14	.72	.30	1.32
(4) Number of Children	-1.17	-1.14	-.99	-1.27	1.47	1.39
(5) Father Presence[2]	3.66	2.02*	—	—	.36	.13
(6) Mom WAIS[3]	—	—	—	—	.47	2.39*
(7) Rooms per Person	—	—	-3.61	1.16	—	—
(8) HOME Inventory[4]	—	—	.26	1.67	—	—
(9) Treatment	5.51	3.34 **	4.20	2.04*	6.40	2.63*
Multiple R[5]	.38		.30		.49	
Interactions						
1 X 9	1.12	-.34	6.38	1.54	-1.52	-.31
2 X 9	-.68	-.61	.56	.78	1.95	1.33
3 X 9	.15	.41	-.48	-1.36	.44	.89
4 X 9	.27	.21	-1.15	-.87	-.58	-.28
5 X 9	1.38	.40	—	—	5.45	1.01
6 X 9	—	—	—	—	-.03	-.07
7 X 9	—	—	15.01	2.71**	—	—
8 X 9	—	—	.09	.29	—	—

*p <.05
**p <.01

[1] Male = 1 Female = 2

[2] Present = 1 Absent = 0

[3] Sum of three scale scores from the Wechsler Adult Intelligence Scales: Vocabulary, Similarities, Comprehension

[4] Total score on Caldwell's HOME Inventory administered before the start of the Houston program

[5] Multiple R after adding all independent variables, but excluding interactions

in Houston is particularly surprising because Palmer's concept training curriculum (Palmer, 1970) was an explicit component of the Houston program. The CFI was designed to demonstrate the effects of this curriculum. The failure to find positive results might be attributed to invalidity of the criterion scores, but the available evidence appears to refute this explanation. Scores are well below the test ceiling (maximum possible score = 50). The correlation with Stanford-Binet scores was .63, indicating that the score must represent more than random noise.* Furthermore, in the Houston regression analysis, mother's age, number of children in the family, rooms per person, and the total score from the HOME pretest all had statistically significant regression weights, contributing to a multiple correlation of .44. But even when these background factors were statistically controlled, the treatment effect was not significant ($\underline{t}[100] = 1.04$).

The regression analyses indicated no significant interactions between the background variables and treatment in any site. In New Orleans, the only significant predictor of CFI score, in addition to treatment, was the mother's WAIS score ($\underline{t}[56] = 2.87$). None of the background variables in Birmingham contributed significantly to the prediction of the CFI score.

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*The correlation with the Stanford-Binet in New Orleans was .57, but in Birmingham it was only .30. Thus, the construct validity evidence in Birmingham is weaker, and the failure to find significant results there may reflect some problem with test administration or scoring.

TABLE 5.6

Concept Familiarity Index

36 months

		Program	Control	t
Site				
	N	97	71	
Birmingham	M	27.19	25.97	1.59
	SD	4.80	5.01	
	N	58	73	
Houston	M	36.33	34.64	1.47
	SD	6.07	6.81	
	N	38	43	
New Orleans	M	33.39	28.02	4.00**
	SD	4.69	7.01	

**p<.01

Bayley Mental Development Index. The Bayley Scales of Infant Development were the only other measures of child cognitive ability administered in all three sites. This measure is not age appropriate at 36 months, but is appropriate at 24 months.* Thus, it is a useful measure of program effects after about a year and a half of the program in Birmingham and New Orleans. The 24-month testing corresponds to the end of the in-home program in Houston. Table 5.7 indicates that there were significant differences on the Mental Development Index in all three sites, demonstrating that there are measurable impacts a full year before the programs' end. In Houston, the Bayley was dropped in early 1975, and the table therefore reflects scores from only two cohorts.

It is sometimes argued that a demonstration of group differences on an infant mental development scale is meaningless because the scores do not correlate with later indicators of mental competence. While this may be true for the very early Bayley scores, the 24-month Bayley MDI in the Birmingham sample correlates .56 (N=169) with 36-month Stanford-Binet IQ, .43 (N=140) with 48-month IQ, and .37 (N=110) with 60-month scores. In Houston, the correlation is .46 (N=94) with 36-month Stanford-Binet IQ, .74 (N=22) with 60 month IQ on the Wechsler Preschool and Primary Scales of Intelligence, and .41 (N=21) with IQ at age 7 on the Wechsler Intelligence Scale for Children. In New Orleans, the correlations were .49 (N=71), .49 (N=51), and .30 (N=12), with 36-, 48-, and 60-month Stanford-Binet IQ, respectively.

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*Test administration in Birmingham was actually closer to the 22-month birthday, but is referred to as a 24-month test to simplify the discussion.

TABLE 5.7

Bayley Mental Development Index

24 months

		Program	Control	t
Site				t
	N	105	84	
Birmingham	M	96.74	88.75	4.79 **
	SD	10.04	12.89	
	N	65	73	
Houston	M	97.57	90.99	3.24 **
	SD	12.59	11.26	
	N	42	52	
New Orleans	M	95.48	87.13	3.21 **
	SD	14.22	10.97	

$^{**}p<.01$

Regressions of the background variables on the Bayley Mental Development Index are presented in Table 5.8. No significant interactions of the background variables and treatment were noted.

Other measures. Two additional 36-month child tests were administered in New Orleans, the Pacific Test Series and the Ammons Full-Range Picture Vocabulary Test. Neither test was administered to the last graduating cohort.

Scores on the Pacific, a test of abstraction abilities, did not indicate any significant program effects. However, mean scores were at least 30 (out of a total possible of 40) in both program and control groups, and the lack of a difference may then be attributed to a ceiling effect on the test. As Table 5.9 suggests, the ceiling explanation appears especially likely because there was a significant difference at 30 months.

Although increasing sight vocabulary was not a specific component of the New Orleans curriculum, the Ammons did demonstrate significant program effects as indicated in Table 5.10.

Mother Effects

Mother-child interaction observations. Summary scores were created for all the mother-child interaction observations, reflecting conceptually related and/or statistically correlated variables. Although the individual variables are interesting and have great descriptive power, the composite dimension provides a more complete assessment of program effectiveness and is consistent with the goals of the programs, which included broad effects on an interrelated complex of positive mothering skills.

TABLE 5.8

Regressions of Background Variables - Bayley Mental Development Index

24 months

Independent Variables	Birmingham (df=164)		Houston (df=110)		New Orleans (df=73)	
	Weight	t	Weight	t	Weight	t
(1) Child's sex[1]	.99	.58	3.32	1.61	3.81	1.20
(2) Mom Education	.70	.98	.34	.92	-.53	-.54
(3) Mom Age	-.10	-.31	.19	.87	.40	1.56
(4) Number of children	.53	.50	-.78	-1.18	-1.72	-1.31
(5) Father Presence[2]	4.62	2.47*	—	—	-1.13	-.32
(6) Mom WAIS[3]	—	—	—	—	.69	2.73**
(7) Rooms per person	—	—	-4.92	-1.64	—	—
(8) HOME Inventory[4]	—	—	.50	2.72**	—	—
(9) Treatment	7.49	4.39**	6.98	3.34**	7.16	2.28*
Multiple R[5]	.38		.46		.53	
Interactions						
1 X 9	.99	.29	8.06	1.94	-5.57	-.91
2 X 9	-1.08	-.89	-.49	-.68	-.77	-.40
3 X 9	-.07	-.19	.21	.63	-.51	-.90
4 X 9	.91	.69	-1.52	-1.57	-1.37	-.49
5 X 9	-4.25	-1.20	—	—	-.91	-.13
6 X 9	—	—	—	—	1.01	1.96
7 X 9	—	—	4.38	.82	—	—
8 X 9	—	—	-.41	-1.12	—	—

*p<.05
**p<.01

1 Male = 1 Female = 2

2 Present = 1 Absent = 0

3 Sum of three scale scores from the Wechsler Adult Intelligence Scales: Vocabulary, Similarities, Comprehension

4 Total score on Caldwell's HOME Inventory administered before the start of the Houston program

5 Multiple R after adding all independent variables, but excluding interactions.

TABLE 5.9

PACIFIC TEST SERIES

(30 and 36 month)

		Program	Control	t
30-Month	N	42	44	
	M	24.19	20.80	2.14*
	SD	7.08	7.63	
36-Month	N	32	42	
	M	32.09	30.00	1.43
	SD	5.29	6.86	

*p<.05

TABLE 5.10

Ammons Full Range Picture Vocabulary Test
(36 months)

	Program	Control	t
N	34	38	
M	13.44	11.11	3.66**
SD	3.38	3.09	

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*p < .05

Birmingham waiting room positive maternal interaction score. As described in Chapter 4, 18 variables were coded for occurrence or nonoccurrence during each of 25 15-second units; these were summed for totals over 6 minutes. After eliminating very low frequency scores, the correlation of the scores was inspected, and the following 9 scores were noted to be positively intercorrelated and logically related: active participation, general conversation, labeling, facilitation of child's activity, asking the child questions, playing with the child, looking at the child, non-controlling talk, and giving information. The 6-minutes totals for these nine scores were summed for the Birmingham waiting room "Positive Maternal Interaction" score.

Birmingham teaching situation effective teacher score. Each of the following 4 scales were rated at the end of each minute, and averaged over the 6-minute teaching tasks: quality and timing of instructions, use of praise, encouragement, use of questions vs. orders. A fifth scale, "pace," was rated once at the end of the 6 minutes. The "Effective Teacher" score is the sum of these ratings.

Houston structured teaching situation net positive maternal behavior score. As described in Chapter 4, 6 scales were used to rate each 1-minute videotaped MISS unit; these ratings were averaged for each of 5 tasks, then averaged across all 5 tasks. After dropping two of the scales that had very low frequencies, the Net Postive Maternal Behavior Score was created by adding together the positive scores (affection, praise, and encouragement of child's verbalization) and subtracting the negative score (criticism). All three PCDC curricula emphasized that although all mothers occasionally are negative or restrictive with their children, the balance of positive and negative maternal behavior has an important impact on the child. The net positive maternal behavior score reflects this concept of balance.

Houston HOME total score. Caldwell's Home Inventory of 45 maternal behaviors is categorized into 6 subcategories (see Chapter 4), which are totalled for a summary HOME score.

New Orleans waiting room net positive maternal language score. As described in Chapter 4, maternal behaviors coded according to frequency of occurrence are clustered into 6 scores: Positive Language, Directive Language, Negative Language, Postive Techniques, Directive Techniques, and Negative Techniques. Because preliminary analyses indicated that the techniques categories overlapped the language categories, but were less reliable, they have been dropped. The Net Positive Maternal Language Score was created by subtracting the Negative Language Score and the Directive Language score from the Positive Language score.

New Orleans waiting room sensitivity rating. Of the three global ratings used in New Orleans for the total interaction, sensitivity is the most summative, and adds a qualitative dimension not present in the frequency-based Net Postive Language score.

New Orleans teaching situation effective teacher score. This observation is identical to the Birmingham Teaching situation, and the New Orleans Effective Teacher Score is identical to the Birmingham score.

Indeed, this task was scored by sending the New Orleans tapes to Birmingham to be rated.

Program effects on mothers. As indicated in Table 5.11, all three programs demonstrated significant positive effects on mothers' observed behaviors toward the children at the time of graduation from the program. The regressions of the background variables for the summary maternal variables are presented in Table 5.12. As with the child variables, the lack of relationship between background variables and maternal scores is striking; it is probably accounted for by the relatively homogeneous samples. In contradiction to many reported studies of mother-child interaction, sex of child was not related to maternal behavior. This may be the result of the use of macro or summative maternal behaviors in the PCDC results, in contrast with micro behaviors used in most other studies that have found sex differences.

The demographic variables were also tested for possible interaction with treatment effects. Only one interaction was significant, sex x treatment in the Birmingham Effective Teacher score. This finding suggests that the program was more effective for mothers of boys; however, this finding is not replicated in the Birmingham Effective Teacher scores at 24 months (Table 5.13) or at 48 months (Table 6.9), nor in the Birmingham Positive Maternal Interaction scores (Tables 5.11, 5.13, 6.9), nor in any of the other sites.

Table 5.13 demonstrates that the positive program effects on the mothers' interaction with their children were observable at least a full

Table 5.11

Summary Maternal Behaviors in Mother-Child Interaction Observations

36 months

Birmingham		Program	Control	t
Postive Maternal Interaction (waiting room)	N	86	70	2.47**
	M	65.59	53.60	
	SD	30.78	29.52	
Effective Teacher (structured teaching)	N	84	67	4.09**
	M	12.06	10.28	
	SD	2.49	2.86	
New Orleans				
Net Positive Maternal Language (waiting room)	N	42	31	2.77**
	M	30.26	7.24	
	SD	27.07	39.93	
Sensitivity (waiting room)	N	42	31	2.28*
	M	6.29	5.19	
	SD	1.62	2.30	
Effective Teacher (structured teaching)	N$^{\#}$	11	13	2.34*
	M	10.85	9.65	
	SD	1.03	1.40	
Houston				
Net Positive Maternal Behavior (structured teachings)	N	79	82	4.18**
	M	8.50	7.70	
	SD	1.00	1.38	
Home Total Score (Caldwell Home Inventory)	N	99	108	2.61**
	M	36.98	33.39	
	SD	4.9	5.9	

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* <.05

** <.01

$^{\#}$ Data available only for the cohort entering in 1972.

TABLE 5.12

Regressions of Background Variables on Selected Maternal Behaviors

From Mother-Child Interaction Observations
36 months

INDEPENDENT VARIABLES	BIRMINGHAM				HOUSTON				NEW ORLEANS			
	MCI-Positive Interaction (df=126)		MCI-Effective Teaching (df=121)		Net Positive Maternal Behavior (df=116)		Total HOME (df=144)		Positive Language (df=45)		Negative Language (df=45)	
	Weight	t	Weight	t	Weight	t	Weight	t	Weight	t	Weight	t
(1) Child's sex [1]	-2.81	-.53	.02	.03	-.08	-.36	.49	.55	-5.10	-.89	-1.52	-.64
(2) Mother education	.66	.30	-.11	-.52	.02	.48	.19	1.23	-3.23	-1.68	.14	.17
(3) Mother age	.66	.60	.24	2.20*	.01	.57	.09	1.02	-.20	-.37	.23	1.04
(4) No. of children	-1.62	-.46	-.40	-1.18	-.08	-1.18	-.18	-.56	-.81	-.34	-.30	-.31
(5) Father presence [2]	-1.18	-.20	.89	1.56	--	--	--	--	.12	.02	-4.03	1.55
(6) Mother WAIS [3]	--	--	--	--	--	--	--	--	.82	1.94	-.26	-1.46
(7) Rooms per person	--	--	--	--	-.40	-1.20	1.79	1.37	--	--	--	--
(8) HOME inventory [4]	--	--	--	--	.05	2.50*	.17	2.50*	--	--	--	--
(9) Treatment	7.14	1.34	1.68	3.25**	.90	4.17**	3.89	4.34**	9.40	1.68	-.45	-.20
Multiple R [5]	.16		.39		.41		.44		.48		.35	
INTERACTIONS												
1 X 9	-10.07	-.94	-2.09	-2.04*	-.15	-.05	.53	.97	6.43	.55	-.43	-.09
2 X 9	-.95	-.26	-.35	-1.02	-.11	-.22	.00	.08	6.12	1.78	1.45	-.74
3 X 9	.41	.36	-.11	-.98	.23	1.09	-.16	-1.75	1.24	1.10	-.10	-.21
4 X 9	-2.34	-.59	-.43	-1.13	.81	1.04	.06	.48	4.01	.88	.18	.10
5 X 9	11.42	1.02	.74	.67	--	--	--	--	19.95	1.67	-9.35	-1.92
6 X 9	--	--	--	--	--	--	--	--	-.54	-.60	.19	.53
7 X 9	--	--	--	--	-6.88	-1.96	.36	.52	--	--	--	--
8 X 9	--	--	--	--	-.43	-1.81	-.07	-1.25	--	--	--	--

*$p \leq .05$
**$p < .01$

1 Male=1 Female=2
2 Present=1 Absent=0
3 Sum of 3 scale scores from Wechsler Adult Intelligence Scales: Vocabulary, Similarities, Comprehension
4 Total score on HOME administered before start of Houston program
5 Multiple R after adding all independent variables, but excluding interactions.

TABLE 5.13

Summary Maternal Behaviors in Mother-Child Interaction Observations

24 months

		Program	Control	t
Birmingham				
Positive Maternal Interaction (waiting room)	N	84	59	3.90**
	M	70.94	51.56	
	SD	31.72	25.38	
Effective Teacher (structured teaching)	N	84	57	5.57**
	M	10.26	8.20	
	SD	8.20	2.03	
New Orleans#				
Net Positive Maternal Language (waiting room)	N	8	7	2.74*
	M	124.63	74.29	
	SD	44.16	21.31	
Sensitivity (waiting room)	N	8	7	4.33**
	M	6.63	7.0	
	SD	1.30	1.0	
Houston				
Net Positive Maternal Behavior (structured teachings)	N	79	82	<1
	M	7.98	8.02	
	SD	1.05	1.11	
Home Total Score (Caldwell Home Inventory)	N	187	131	2.61**
	M	34.35	32.52	
	SD	6.00	6.38	

*p<.05

**p<.01

#24 month data available for 1972 cohort only.

year before graduation in New Orleans and Birmingham. Maternal effects at 24 months are less clear in Houston; the total HOME score significantly differentiates between program and control mothers, but the structured teacher score does not. This may be related to the Houston program beginning as a home-visit program at the child's age of 12 months, in contrast to the center-based programs beginning between the child's age 2-5 months in New Orleans and Birmingham. By 36 months, after 2 years of program (one home visit year and one center year), the Houston mothers show effects equal to the mothers in the other two PCDCs (Table 5.11).

Complete scores on the coded maternal behavior at 36 months are presented for the New Orleans Waiting Room (Table 5.14), the Houston Teaching Situation (Table 5.15) and the Houston HOME checklist (Table 5.16). These individual scores are generally consistent with the summary scores. An exception is the Negative Language score in New Orleans at 36 months; this score had low frequency for both program and control groups at 36 months, although it differentiated between groups at 24 months (see Appendix D). Acceptance and cooperation in New Orleans also did not differentiate between program and control groups at 36 months (Table 5.14) although they did at 24 months (Appendix D); there is a possibility that these global ratings developed for infants cannot effectively differentiate between mothers of older children.

The regression analyses of background variables with the 24-month summary maternal variables are presented in Table 5.17. The Houston data show a number of background variables significantly related to the HOME total score (mother's age, number of children, rooms per person, 12-month HOME score); none of these interact significantly with treatment. By 36

Table 5.14

Complete Maternal Behaviors on New Orleans Mother-Child Interaction

Waiting Room Observations

36 months

Maternal Behavior		Program	Control	t
Sensitivity - Insensitivity	N	42	31	2.28*
	M	6.29	5.19	
	SD	1.62	2.30	
Acceptance - Rejection	N	42	31	1.02
	M	6.87	6.52	
	SD	1.31	1.55	
Interference - Cooperation	N	42	31	1.25
	M	6.03	5.48	
	SD	1.96	1.98	
Net Positive Language	N	42	31	2.77**
	M	30.26	7.24	
	SD	27.07	39.93	
Positive Language	N	42	31	2.53*
	M	79.71	68.50	
	SD	14.63	21.24	
Control Language	N	42	31	2.72**
	M	52.88	38.29	
	SD	21.94	23.65	
Negative Language	N	42	31	<1
	M	8.5	7.97	
	SD	9.46	8.00	

*$p<.05$

**$p<.01$

Table 5.15

Complete Maternal Behaviors on Houston Structured Teaching Mother-Child Interaction

36 months

Maternal Behavior		Program	Control	t
Mother's Affectionateness	N	79	82	2.89**
	M	4.93	4.68	
	SD	.48	.61	
Mother's Praise	N	79	82	2.04*
	M	2.18	2.04	
	SD	.41	.46	
Mother's Use of Criticism	N	79	82	-2.79**
	M	1.21	1.34	
	SD	.24	.35	
Mother's Control of Child Behavior	N	65	75	-2.28*
	M	3.14	3.29	
	SD	.38	.43	
Mother's Use of Reasoning	N	79	82	-1.95
	M	1.10	1.14	
	SD	.11	.16	
Mother's Encouragement of Child's Verbalization	N	79	82	3.57**
	M	2.59	2.32	
	SD	.51	.46	
Mother's Net Positive Behavior (Affection + Praise + Encourage Verbalization -Criticism)	N	79	82	4.18**
	M	8.50	7.70	
	SD	1.00	1.38	

*p<.05

**p<.01

Table 5.16

Complete Maternal Behaviors on Houston Home Inventory

36 months

Factor		Program	Control	t
Emotional and Verbal Responsivity of Mother	N	99	108	2.27*
	M	9.80	9.20	
	SD	1.69	2.04	
Avoidance of Restriction and Punishment	N	99	108	1.31
	M	6.01	5.69	
	SD	1.84	1.72	
Organization of Environment	N	99	109	1.98*
	M	5.35	5.11	
	SD	.81	.95	
Provision of Appropriate Play Materials	N	99	109	5.59**
	M	7.87	6.47	
	SD	1.50	2.04	
Maternal Involvement with the Child	N	99	109	1.21
	M	3.79	3.51	
	SD	1.61	1.65	
Opportunities for Variety in Daily Routine	N	99	109	5.00**
	M	4.12	3.40	
	SD	.94	1.16	
Total (1-6)	N	99	108	4.73**
	M	36.98	32.39	
	SD	4.93	5.90	

*p<.05

**p<.01

TABLE 5.17

Regressions of Background Variables on Selected Maternal Behaviors from Mother-Child Interaction Observations

24 months

INDEPENDENT VARIABLES	BIRMINGHAM				HOUSTON			
	MCI-Positive Interaction (df=138)		MCI-Effective Teaching (df=133)		Net Positive Maternal Behavior (df=168)		Total HOME (df=242)	
	WEIGHT	t	WEIGHT	t	WEIGHT	t	WEIGHT	t
(1) Child's sex[1]	4.71	.93	.68	1.50	.04	.22	.81	1.16
(2) Mother education	1.40	.70	.01	.06	-.04	-1.26	.17	1.22
(3) Mother age	-.11	-.10	.17	1.74	-.01	-.78	.14	2.10*
(4) No. of children	-3.40	-1.03	-.34	-1.14	.08	1.46	-.44	-2.02*
(5) Father presence[2]	4.77	.86	.49	.99	—	—	—	—
(6) Mother WAIS[3]	—	—	—	—	—	—	—	—
(7) Rooms per person	—	—	—	—	.23	.96	2.73	2.66**
(8) HOME inventory	—	—	—	—	.06	4.25**	.21	3.76**
(9) Treatment	9.37	1.86	1.70	3.75**	-.07	-.41	2.73	3.88**
Multiple R[5]	.25		.38		.34		.46	
INTERACTIONS								
1 X 9	-11.10	-1.10	.27	.30	.25	.75	.69	.49
2 X 9	-1.08	-.33	-.47	-1.62	-.08	-1.50	-.16	-.62
3 X 9	.07	.06	-.01	-.08	-.01	-.20	.00	-.04
4 X 9	.04	-.01	-.03	-.07	.10	1.28	-.07	-.21
5 X 9	.26	.02	1.19	1.26	—	—	—	—
6 X 9	—	—	—	—	—	—	—	—
7 X 9	—	—	—	—	.45	1.12	2.40	1.36
8 X 9	—	—	—	—	.05	1.81	.10	.91
5 X 1 X 9	1.77	.37	-.62	-1.48	—	—	—	—

*$p<.05$

**$p<.01$

1 Male=1 Female=2

2 Present=1 Absent=0

3 Sum of 3 scale scores from Wechsler Adult Intelligence Scales: Vocabulary, Similarities, Comprehension

4 Total score on HOME administered before start of Houston program

5 Multiple R after adding all independent variables, but excluding interactions.

months, these effects of background variables have disappeared, and the Houston 36-month score is predicted only by treatment group. Sample sizes for the 24-month score in New Orleans were too small to permit meaningful regression analysis.

Maternal attitude questionnaires. Results of maternal attitude questionnaires given to small samples at program graduation in Birmingham and New Orleans are presented in Table 5.18. The Birmingham Graduation Interview was an attempt to measure changes in mothers' problem-solving behaviors in their interaction both with their children and other people. The interview consisted of two types of questions: those consisting of hypothetical situations for which a strategy was required in reply, and simply information questions (See Appendix C). The final form of the interview, covering 5 categories (general life situation, child control, style of problem solving, achieving solutions, and response to authority) was developed after several years of experimentation; unfortunately it had to be discontinued soon after because of funding limits and the amount of testing.

Two of the five broad, general outcome categories showed significant differences between program and control mothers: perception of general life situation since the target child's birth, and successful child control strategies. These two categories are the most concrete, and also most closely related to the PCDC program and immediate goals. It is possible that either the questions in the other 3 categories were too theoretical, or too far removed from direct program teaching, to effectively differentiate mothers.

Table 5.18

Responses to Maternal Attitude Questionnaires in Birmingham and New Orleans

36 months

Birmingham Graduation Interview	Program (N=24) $\bar{M}$ (SD)	Control (N=14) $\bar{M}$ (SD)	t	Multivariate F
General Life Situation				2.94*
Good changes	2.04(1.37)	.86(1.03)	2.81	
Bad changes	.50(.93)	1.00(.88)	-1.63#	
Satisfaction w/changes	2.46(.66)	1.86(.86)	2.42**	
Child Control				3.53**
Positive control techniques	5.25(.94)	4.64(.74)	2.06*	
Discussion used in discipline	2.25(.103)	2.07(1.33)		
Physical punishment	1.12(. 95)	1.93(1.00)	2.48**	
General discussion	2.75(.107)	2.00(1.52)	1.78*	
Adult Problem Solving				
Achieving Solutions				2.35
Alternative solutions	1.81(.33)	1.75(.24)	<1	
No. of resources	13.25(2.25)	11.93(3.48)	1.42#	
Competence	1.75(.26)	1.63(.28)	1.36#	
Assertiveness	2.15(.35)	1.98(.35)	1.45#	
Response to Authority				<1
Power/status orientation	2.00(1.22)	1.79(.80)	<1	
Appropriateness of authority figure	85% (23)	80% (23)	<1	
Style of Problem Solving				1.71
Interpersonal orientation	1.41(.20)	1.28(.28)	1.57#	
Use of punishment	.75(.60)	1.50(1.22)	-2.53**	
Discussion	3.75(1.42)	3.36(1.28)	<1	
Information seeking	2.04(1.46)	1.71(1.20)	<1	

New Orleans Stanford Parent Questionnaire	(N=11)	(N=18)		
Independence	19.18(2.93)	18.61(2.99)	<1	
Aggression	24.45(4.80)	26.94(4.63)	-1.39	
Punishment	8.55(2.30)	10.56(2.12)	-2.40**	

*p<.05
**p<.01
#p<.10

Table 5.18 also presents results for a single New Orleans cohort who received a substantially revised version of the Stanford Parent Questionnaire (Winder & Rau, 1962). The revisions were so extensive that the original scoring categories could no longer be used. Three new scales were developed based on a logical a priori grouping of the items which was then confirmed by inspection of item intercorrelations. Items with low item scale correlations were deleted from the scale. The first scale consisted of six items related to the mother's encouragement of independence in her child. The second scale contained five items that indicated maternal approval of physical aggression in her child. The third scale contained three items which indicated maternal approval of physical punishment techniques. Coefficient alpha was .66, .54, and .43 for the independence, aggression, and punishment scales respectively. These are relatively high internal consistency reliabilities considering the number of items on the scales. Of the three summative categories, mothers' approval of punishment significantly differentiates program and control mothers. This is consistent with results from a similar question in the Birmingham Graduation Interview, as well as with results from the mother-child interaction observation.

Direction of Effect—Relationships between Child and Mother Outcomes

The results presented demonstrate that the PCDC programs had significant effects on mothers' child rearing behaviors and attitudes. However, the causal direction of the observed mother effects has not been established. An initial underlying assumption of the PCDC project was that the programs affect the mothers, and the mothers affect the children. However, the children attended the programs as well, and had positive learning experiences there. The children as well as the mothers show program effects as early as 24 months. One hypothesis is that the program affected the child by changing the mother's behavior. Another hypothesis is that the program affected the child who in turn affected the mother. A third alternative might be that there were two independent program effects: one path from the program to the mother, another from the program to the child, with some reciprocal effects.

The relatively small repeated _N_'s at each site do not permit statistical attempts, such as path analysis or causal model analysis, to resolve the question of direction of effect in the PCDC mother and child data.

Attendance

Not all mothers who graduated from the PCDCs attended regularly. Because of conflicts with work schedules, illness, or simple disinterest, many mothers missed a substantial number of the scheduled sessions. Program impact might be expected to be related to frequency of attendance.* This section investigates the correlation of attendance data with selected outcome measures. In addition, the relationship of attendance data to background variables is considered in order to determine whether such variables as level of maternal education or number of children in the family are related to regularity of attendance. Finally, information on the total number of graduates produced in each site is presented.

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*In general, the number of days the program was offered in a given month was about the same for all mothers. There could be small discrepancies in New Orleans where one group of mothers attended two days a week and another group of mothers attended for a different two days. A holiday might then affect one group of mothers but not the other. In Birmingham, larger discrepancies were possible because the regular program for "participating mothers" was 3 days a week while for "senior participating mothers" and "model mothers" it was 5 days per week.

Starting in September of 1975, Bank Street College of Education was responsible for collecting and organizing attendance information from each site. Although some attendance data had been collected prior to Bank Street involvement, it was of very uneven quality. Therefore, only the data collected by Bank Street College are considered here.

Each month, for each mother, the total number of days the mother attended the program was recorded along with the total number of days that the program was offered. A percent of attendance figure was derived by dividing the number of days attended by the number of days offered. In Houston, the first year of the program was a home-visit program, so only data from the second year center-based program were included in the analyses.

Mean percent attendance for graduating mothers in each site is presented in Table 5.19. Note that these means include only mothers who were considered by program staff to be graduates; mean attendance for all mothers on the roster at any given time (i.e., including all mothers who eventually dropped out) would be substantially lower. The relatively high mean percent attendance figure in Birmingham indicates that graduating mothers there were exposed to most of the program, but it does not necessarily indicate greater interest in the program there since mothers with poor attendance records were usually dropped from the program before they reached graduation. In contrast, New Orleans staff was very reluctant to drop any mothers even if their attendance records were fairly poor.

TABLE 5.19

Mean Percent Attendance

(days attended/days offered)

		Birmingham	Houston	New Orleans
% days attended	N	69	107	45
	M	86.15	76.65	61.44
	SD	12.76	22.78	13.21

The correlation of attendance with selected background information for graduating mothers in the three sites is presented in Table 5.20. In both Birmingham and New Orleans there was a tendency for more educated mothers to attend more regularly. However, mother's age and number of children in the family were unrelated to attendance.

The relationship of attendance to selected outcome variables assessed at the time of graduation from the program is presented in Table 5.21. There were no significant relationships between attendance and the outcome variables, suggesting that among those mothers who graduate, those who attend most frequently do not demonstrate any special advantage.

The attendance analyses presented here did not attempt to investigate more complex relationships in the data (e.g., mothers who had a uniformly moderate rate of attendance vs. mothers with the same percent attendance score who attended very regularly one year and very sporadically in another year). These more complex relationships will be investigated in a separate study currently in progress.

Number of program graduates. An additional part of the attendance picture is the number of graduates each program produced. The three programs were funded at about the same level, but because of different model features as well as recruitment and other implementation problems, there were substantial differences in the number of graduates from each site. The information in this section is provided for descriptive purposes, and the reader should remember that each program was operating in a different location, serving a particular population with unique problems. The program that appears most successful in terms of number of graduates produced might be less successful in a different setting, and vice versa.

TABLE 5.20

Correlation of Percent Attendance With Selected Background Variables

	Birmingham		Houston		New Orleans	
	N	r	N	r	N	r
Mother's education	68	.28*	85	.07	42	.34*
Mother's age	68	.13	97	.04	41	-.11
Number of children	68	.09	92	.01	43	-.07
Mother's WAIS[1]	--	--	--	--	35	.21

*$p<.05$

[1] WAIS = sum of information, vocabulary, and similarities subscales from the Wechsler Adult Intelligence Scales

TABLE 5.21

Correlation of Percent Attendance
With Selected Outcome Variables Assessed at Graduation

	Birmingham		Houston		New Orleans	
	N	r	N	r	N	r
Stanford-Binet IQ	63	.11	54	.21	33	.04
Mother-Child Interaction scores						
-Positive Interaction	55	-.19	--	--	--	--
-Effective Teaching	54	.26	--	--	--	--
-MISS Affection	--	--	21	.31	--	--
-MISS Praise	--	--	21	-.06	--	--
-MISS Encourage Verbalizations	--	--	21	.03	--	--
-% Positive Language	--	--	--	--	19	-.04
HOME Total	--	--	54	.11	--	--

*$p<.05$

Birmingham graduates. In the period beginning when the first cohort was recruited for the evaluation study (1972) and ending when the last evaluation cohort graduated (1980), the Birmingham program produced 93 graduates which was about 47% of the families initially recruited for the program and listed on the attendance roster. Mothers had to attend at least 10 times before being listed on the attendance roster.* More than half of these graduates (47) entered the program in 1972 or 1973, 16 entered in 1974 and 1975, and 30 entered in 1976 and 1977. Some of the decline in the number of graduates may be attributed to a reduction in funding level after the initial cohorts graduated. The percentage of families initially recruited who graduated declined steadily (89% for '72-'73 entrants, 44% for '74-'75, and 28% for '76-'77).

Houston graduates. In the same time period (1972-1980), the Houston PCDC graduated 155 mothers (57% of the mothers initially listed on the roster). Part of the reason for the larger number of graduates in Houston is that it is a two-year program, allowing more cohorts to enter and graduate over a fixed number of years. The number of graduates per year declined slightly after the initial cohorts, but remained relatively high. Out of the '72-'73 entrants 44 graduated, 42 from '74-'75, 47 graduated from the '76-'77 entrants, and 22 graduated from the last evaluation cohort which entered the program in 1978. The percentage of families initially recruited that graduated remained fairly high (51% in '72-'73, 69% in '74-'75, 64% in '76-'77, and 51% in 1978).

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*Note that in Birmingham the attendance roster is somewhat different from the roster used in the attrition analyses at the beginning of this chapter. The roster used in the attrition analyses included all mothers who agreed to participate in the program even if they never attended one session.

New Orleans graduates. During the same 1972-1980 time span, the New Orleans PCDC graduated 53 mothers (33% of the mothers initially listed on the roster). This number includes some mothers who entered the program in 1976 and 1977 and were not formally graduated because the program closed temporarily during a period when many paraprofessional educators were fired and new educators were hired and trained. These pseudo-graduates were in the program for at least two years. Including these pseudo-graduates, only 14 mothers who entered the program in 1976 or 1977 graduated. Of the '72 entrants, 16 graduated: there were no entrants in 1973, or 1974* and 23 mothers graduated from the group of 75 entrants. The percentage of families that graduated was fairly constant over time (33% of the '72 entrants, 38% of the '75 entrants, and 26% of the '76-'77 entrants).

Conclusions. A formal cost analysis or cost-benefit analysis was not a part of the evaluation. However, because each PCDC program received about $300,000 per year (exclusive of the money allocated for research), the above figures on number of graduates make it clear that the cost per graduate is very high. The cost of providing a program for the 301 graduates was more than $20,000 per graduate. The extent to which a less intense, and therefore less expensive, program might produce the same results is unknown. In this regard, the low percent attendance figures from New Orleans are encouraging. The significant effects for New

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*The New Orleans pilot program was very complex. In addition to the center-based pilot group there was also a home visit pilot program, and there was a separate control group that was tested annually in addition to the control group that received tests on the same frequent schedule as the center group. The necessity to evaluate these extra groups in 1973 and 1974 took so much time that recruitment efforts had to be suspended.

Orleans mothers and children occurred even though mean percent attendance figures indicated that mothers attended only a little more than half of the scheduled sessions, and the New Orleans program was only planned as a 2-day per week program.

Summary

The additional data on short-term effects of the PCDC programs collected from 1976 through 1980 essentially replicated and strengthened the findings in the Phase I reports. Thus, the data for the entire period from 1972 through 1980 indicate that the PCDCs had a significant impact on the cognitive development of target children and on the quality of mother-child interactions at the time of graduation from the PCDC. Indeed, significant impacts were evident a year before graduation. The results did not appear to be explainable in terms of differential attrition from program and control groups. Nor were effects limited to target children of a single sex. Within the limits imposed by a relatively homogeneous population, such factors as mother's educational level, mother's age, number of children in the family, and father presence generally did not interact with the treatment. Thus, the PCDCs apparently benefit relatively educated and relatively uneducated mothers, relatively young and relatively old mothers, etc. Although the PCDCs appeared to be a highly effective program for those mothers and children who graduated, they did not produce very many graduates in nearly a decade of operation. Thus, the PCDCs were effective but possibly not very efficient.

Chapter 6

Long-term Impact

Chapter 5 showed that PCDCs have a significant impact on both mother and child scores assessed at the time of graduation from the program. This chapter assesses the lasting effects of the PCDC experience, years after the mother and child have left the program.

It may be unreasonable to expect a program to continue to show an impact years after the treatment ends. Any number of intervening events (e.g., school experiences for mothers and children, work experiences, community activities, financial or medical hardships), could dilute treatment effects that were very strong at the time of graduation from the program. On the other hand, it may be difficult to justify large expenditures of public money if there are no measurable effects two or three years after the program ends. If the intervening events were so powerful as to completely obliterate any treatment effects, it might make more sense as public policy to try and control these events than to support the earlier treatment. Nevertheless, PCDC goal statements clearly indicated that long-term effects were anticipated. It was hoped that two critical features of the PCDC, starting the program shortly after the birth of the target child and focusing relatively intense intervention efforts on the mother, would make long-term impacts more probable. Bronfenbrenner (1974), after reviewing a number of early intervention studies, noted that effects may be especially likely to be sustained in programs containing these two critical features. Making the because if the mothers' behaviors were really changed, the child's environment should continue to be enriched even though he or she no longer attended the PCDC.

In this chapter, several different types of long-term impact are investigated. Follow-up intelligence test scores and mother-child interaction scores were assessed in addition to limited data from follow-up maternal questionnaires and school records. The amount of follow-up data available varied considerably from site to site.

Intelligence test scores at 48 and 60 months were available in all sites (Stanford-Binet in Birmingham and New Orleans, and Wechsler Preschool and Primary Scale of Intelligence in Houston). Although some IQ data were collected at 72 and 84 months, the sample sizes were extremely small and hence are not reported here. Inspection of the means indicated that trends that were apparent at 60 months continued through 72 and 84 months.

Mother-child interaction scores one year after the end of the program (child age 48 months) were available in Birmingham and New Orleans, but not in Houston. Brief maternal follow-up questionnaires at 48- and 60-month were available in Birmingham and at 48 months for one cohort (wave 4) in New Orleans. Additional follow-up testing in Houston, supported by grants from the Hogg and Spencer Foundations, is not discussed in this report. A progress report on the Houston activities is included in Appendix B. Results of a pilot effort to obtain school records for a small sample of Birmingham and New Orleans graduates and their controls are also reported in this chapter.

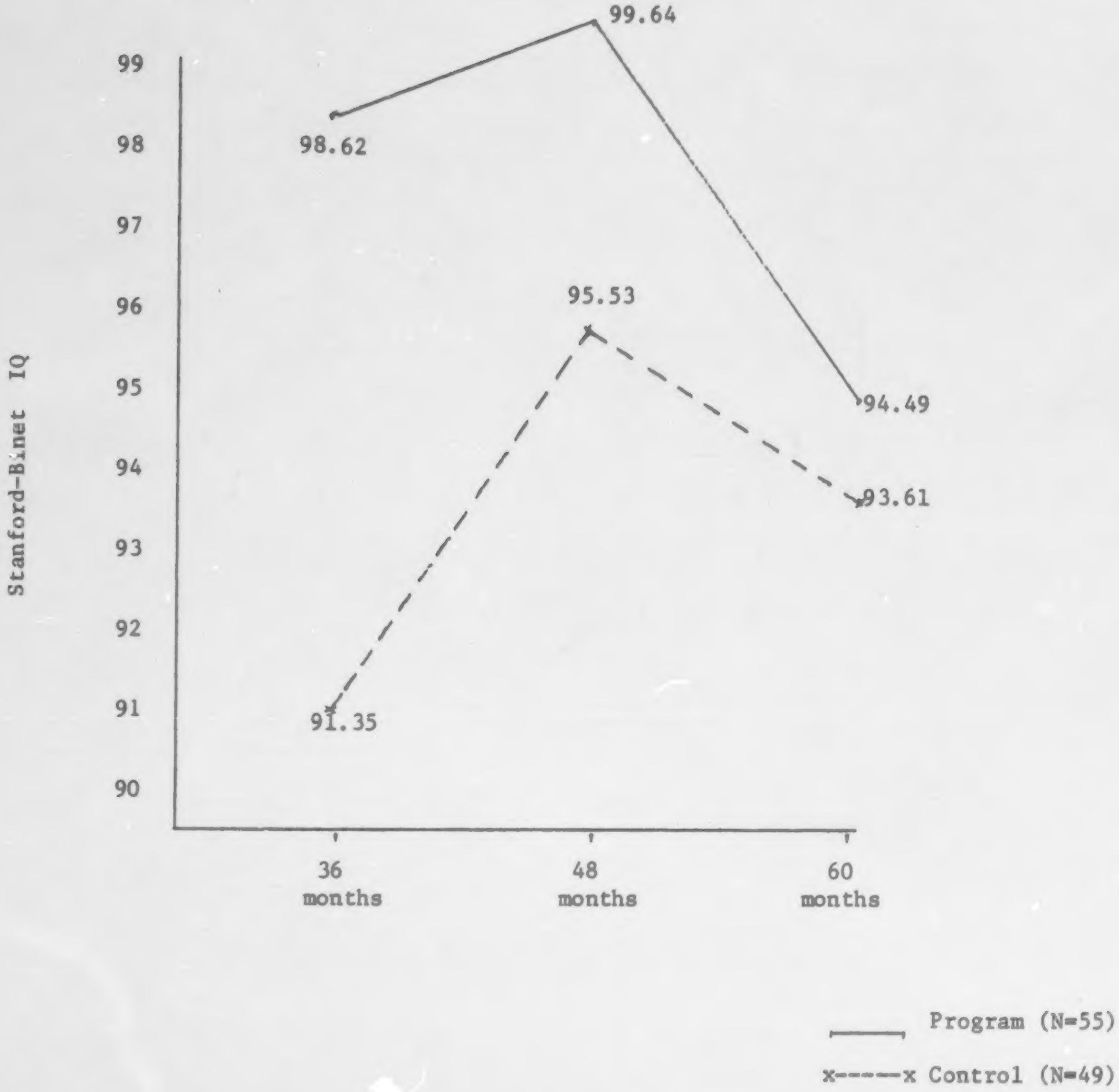
IQ Effects

Birmingham Stanford-Binet results. Stanford-Binet IQ scores for 55 program and 49 control children in the Birmingham sample who had complete IQ data at 36, 48, and 60 months are plotted in Figure 6.1. The strong program-control differences at graduation (36 months) were nearly cut in half by 48 months, and essentially disappeared by 60 months. Neither the 48-month nor the 60-month program-control differences were statistically significant. Note that between 36 and 48 months the program group IQ scores were essentially constant while the control group gained 4 points. Both groups then slid back to a mean IQ of about 94. These changes cannot be explained by differential attrition because this analysis follows exactly the same sample over time.

One factor that might have an important influence on IQ scores after graduation from the PCDC is enrollment in a preschool program. Data relevant to this question were available from the follow-up questionnaire given to program graduate mothers and control mothers one year after the end of the program (i.e., child age 48 months). In this questionnaire mothers were asked whether the target child was enrolled in a preschool program. A broad definition of preschool was used that included relatively structured nursery school and Head Start programs as well as group day care settings. The programs typically lasted at least 4 hours per day; only one child was enrolled in a program less then 4 hours long. Unfortunately, nothing is known about the actual educational content of these programs.

FIGURE 6.1

Birmingham Longitudinal Sample IQ--36 to 60 Months



Scores on the 60-month Stanford-Binet for program and control children who were or were not enrolled in preschool at 48 months of age are presented in Table 6.1. A 2 (program-control) X 2 (enrolled-not enrolled) analysis of variance* on these scores indicates a significant main effect for preschool enrollment (F[1,79] = 6.08, p<.02), but no PCDC treatment effect (F[1,79] = .61) and no interaction (F[1,78] = .47). Thus, it appeared that attendance at preschool was beneficial whether or not the child attended a PCDC, and there was no evidence that PCDC plus preschool was any more beneficial than preschool alone.

Although assignment to the PCDC program and control groups was random, the decision to send a child or not send a child to preschool was completely up to parental discretion. Therefore, what appears to be a preschool effect may in fact merely represent differences in families that choose to send their children to preschool versus families that don't. In an attempt to determine whether differences in family background variables might account for the "preschool" effect, an analysis of covariance was run in which PCDC treatment group and preschool attendance were the independent variables and the following variables from the entry demographic questionnaire were entered as covariates: income per person, mother's

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*A least squares analysis was used to account for the disproportional cell sizes. A heirarchical analysis was employed in which the interaction is tested first, and in the absence of a significant interaction, the mean squares for the main effects are estimated ignoring the interaction term. Thus, the main effects are tested with one more degree of freedom than the interaction.

TABLE 6.1

Means and Standard Deviations on the Stanford-Binet for Program and Control Children with and without Preschool Experience

60-month

		Program	Control
	N	32	17
Preschool	M	95.31	95.77
Experience	SD	10.69	10.68
No	N	16	17
Preschool	M	87.81	91.65
Experience	SD	10.68	10.68

education, mother's age, number of children in the family (at the time of the birth of the target child), father presence, and sex. The results basically replicated the ANOVA results. The PCDC program-control comparison was not significant (F[1,76] = -.46), but the preschool effect was highly significant (F[1,76] = 10.89, p<.01).

Even with the covariance adjustment, the most critical background characteristic could be overlooked. As a final check that the "preschool" variable represented an actual effect of preschool rather than a select sample of families, the covariance analysis was repeated using the 24-month Bayley Mental Development Index as the dependent variable. Because this score was obtained long before any child actually attended preschool, a significant "preschool" effect would indicate that children who eventually were enrolled in preschools were initially intellectually superior to children who were not later enrolled in preschool. Indeed, this is precisely what the covariance analysis revealed (F[1,96]=5.89, p<.02). As expected, the PCDC treatment effect for the Bayley score was also significant (F[1,96]=11.41, p<.01). Although the preschool experience itself undoubtedly had some benefits, it is impossible to completely disentangle the direct effects of preschool and the effects related to other variables in families that choose to send their children to preschool.

New Orleans Stanford-Binet results. Although the New Orleans sample of children with IQ scores at 36, 48, and 60 months was quite small (7 program and 11 control), Figure 6.2 indicates that the general reduction of program-control differences found in Birmingham was replicated. The 14 point IQ difference at 36 months was reduced to an insignificant 4-point difference by 60 months. However, instead of the drop in program group scores noted in Birmingham, most of the reduction in the difference was caused by an increase in control group scores. This consistent improvement in control group scores is difficult to explain. It apparently cannot be attributed to a formal group preschool experience because only four children in the control group were enrolled in a preschool program at 48 months of age.

Houston Wechsler Preschool and Primary Scale of Intelligence results. Houston testing with the WPPSI was very uneven across time periods, so that an analysis of subjects with complete data at 48 and 60 months was not possible. Table 6.2 presents WPPSI scores for all available subjects with 48- or 60-month scores, but the same children generally are not represented at both time points.

The conclusion is the same for Houston as for the other sites; by 60 months of age there were no significant IQ differences between program and control groups.

Conclusions. The notion that early childhood programs for the economically disadvantaged could provide a permanent inoculation against later general cognitive deficits has been generally discredited. The current results suggest that even an intensive program that starts within a year of the birth of the target child and focuses on parenting skills

FIGURE 6.2

New Orleans Longitudinal Sample IQ--36 to 60 Months

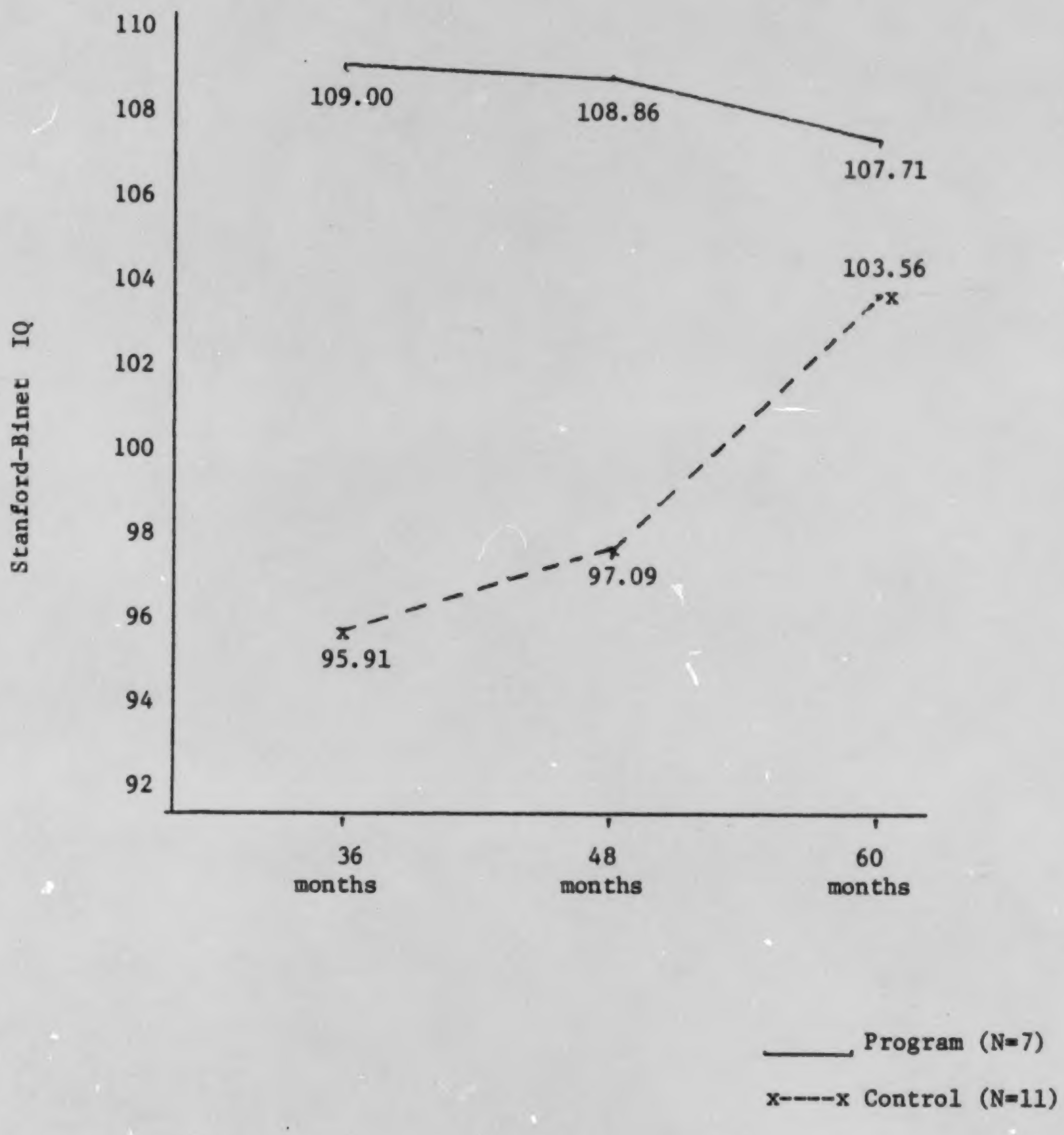

TABLE 6.2

Houston

Wechsler Preschool and Primary Scale of Intelligence

48 and 60 months

		Program	Control	t
	N	22	20	
48 months	M	98.64	90.05	2.37*
	SD	13.82	8.92	
	N	19	27	
60 months	M	98.37	94.37	.96
	SD	16.01	12.16	

NOTE. In general, different children are included in the means for the two time points.

*$p<.05$

does not provide such an inoculation. However, failure to find significant IQ effects beyond age four does not imply that the PCDCs had no long-term effects on the participating children or their mothers. The early intervention projects studied by the Consortium for Longitudinal Studies (1978) showed a similar lack of long-term IQ effects but did demonstrate significant program-control differences in terms of retention in grade, placement into special classes, and mathematics achievement in the fourth grade.

School Achievement

A major effort to obtain information from school records was not possible with the available funds. In preparation for a full-scale follow-up study, an attempt was made to obtain some school records in order to ascertain the difficulty of getting information from the public schools in Birmingham and New Orleans and to get an idea of the potential utility of this information. This pilot data collection effort focused on one cohort from New Orleans (children who entered the program in 1972) and Birmingham graduates who entered the program in 1972 or 1973. The current grade placement of most of these children is second or third grade. The PCDC research staff at the Houston site had already made school contacts and collected some school information with the financial assistance of the Hogg and Spencer Foundations. A report on this research is attached in Appendix B.

Birmingham school analyses. Requests for parental consent to collect school record information were mailed to 57 mothers of program children and 49 mothers of control children who had Birmingham addresses on the roster. The local tester in Birmingham tried to personally contact mothers who did not mail back the form. Of the mothers who could be located, all agreed to sign the form, but many mothers had moved and left no forwarding address. Limited funds did not allow for extensive efforts to locate the missing mothers. Although permissions were obtained from only 19 program mothers and 10 control mothers, there is no reason to believe that there was any systematic bias differentially affecting program and control mothers.

School district personnel were very cooperative, and school records were well organized on microfiche in the district office. Records were located for 14 program and 10 control children. The small sample size and district promotion policies made meaningful analysis of grade retention information impossible. Only one child had ever been retained. Similarly, analysis of special education placement was impossible. The guidance department indicated that it is extremely rare for children under 4th or 5th grade to be placed in special classes, except for physical handicaps. Although attendance at the public school kindergartens was not universal, about half of the children in both groups (7 out of 14 in the program group and 6 out of 10 in the control group) attended kindergarten. Of those children who attended kindergarten, all but one were enrolled in the Title I (supplementary compensatory education) program.

Most of the children were in second or third grade when the data was collected. Because achievement tests were administered in April, the last grade with complete data available was first grade. Reading and mathematics scores were available on the California Achievement Test, Level 11, Form C. The mean standard scores in reading were 302.57 (SD=41.4) in the program group, and 271.1 (SD=30.9) in the control group. Although the means differed by nearly one standard deviation, the difference was not statistically significant with the conservative two-tailed test ($t[22]=1.95$). The mean standard scores corresponded to the 44th percentile on national norms for the program group and the 21st percentile for the control group. The mean standard scores in mathematics were 321.5 (SD=22.9) in the program group and 295.5 (SD=25.8) in the control group. This difference was statistically significant ($t[22]=2.49$, $p<.03$). Corresponding national percentiles were 61 in the program group and 25 in the control group.

The magnitude of the achievement difference is particularly striking considering the small differences observed on the 60-month Stanford-Binet for the same group of children. The mean 60-month* IQ for the 14 children in the program group was 95.21 (SD=11.73), and the mean for the 10 children in the control group was 92.80 (SD=9.14). Thus, the IQ means differed by less than a third of a standard deviation, and the achievement means differed by a full standard deviation. The current results are consistent with findings of the Consortium for Longitudinal Studies (1978); achievement differences apparently persist even though IQ scores of program and control groups converge.

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*IQ scores at 60 months were missing for two children; scores at 72 months for these two children were available and were substituted for the 60-month scores in the analysis.

New Orleans school analyses. The school data in New Orleans were obtained for the only cohort there (besides the pilot cohort) for which school data was available.* The potential sample consisted of 14 program graduates and the 19 controls who had participated in the 36-month child test battery. Efforts to locate the children were very successful; records from at least one school grade were obtained for 12 program and 16 control children. As in Birmingham, the sample was too small, and the children too young for meaningful analysis of grade retentions or placement into special classes.

School achievement test data were available for kindergarten, first, and second grades. The appropriate level of the Comprehensive Test of Basic Skills, Form S, was used in each grade. All tests were administered by the regular classroom teachers near the end of the school year. Reading (prereading skills for kindergarten) and math standard scores for the three grades are presented in Tables 6.3 and 6.4. The substantial program-control differences at the beginning of kindergarten were statistically significant for both prereading ($\underline{t}[18]=2.62$, $\underline{p}<.02$) and mathematics ($t[18]=3.50$, $p<0.1$). The national percentiles for the kindergarten scores in the program group were 49 and 81 for reading and math respectively. Control group scores in both reading and math corresponded to the 11th percentile. Control group means were actually slightly

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*This cohort entered the program in 1972. There was then a gap in the recruitment efforts, and the next cohort did not enter the program until 1975. Children from this 1975 cohort are currently in kindergarten or first grade.

TABLE 6.3

New Orleans CTBS Reading Scores

for Kindergarten, 1st, and 2nd Grades

		Program	Control
	N	9	11
Kindergarten	M	197.0	152.45
	SD	43.28	28.37
	N	10	12
First Grade	M	267.50	275.00
	SD	29.33	43.25
	N	8	10
Second Grade	M	293.50	327.20
	SD	45.98	52.18

TABLE 6.4

New Orleans CTBS Math Scores

for Kindergarten, 1st and 2nd Grades

		Program	Control
	N	9	11
Kindergarten	M	240.33	178.64
	SD	31.26	43.39
	N	10	12
First Grade	M	268.00	271.67
	SD	27.35	32.21
	N	8	10
Second Grade	M	300.25	310.00
	SD	40.17	26.28

higher than program group means in both first and second grades, however there were no statistically significant differences. Although there is considerable overlap in the samples at different grade levels, not all children included in the kindergarten sample were also tested in the first grade, and vice-versa. Seven children in the program group and an equal number of children in the control group had complete data for both kindergarten and first grade. Standard scores and national percentile ranks for this longitudinal sample are plotted in Figures 6.3 and 6.4. The scores for this complete data longitudinal sample reveal the same pattern of results as the previous Tables; large differences in kindergarten are considerably reduced by the end of first grade.

For children in the control group, the initially low scores followed by a dramatic increase might reflect a more difficult school adjustment for children with limited preschool preparation. Another factor possibly contributing to the dramatic increase in the control group is the existence of special compensatory education programs in the public schools. Because scores in the control group were initially lower, more control group children than program group children were eligible for these special programs. Of the seven program group children in the longitudinal analysis cited above, none was in a compensatory program, but 4 out of the 7 children in the control group participated in a Title I compensatory education program.

Conclusions. The PCDC program had a clear impact on school achievement. In Birmingham this effect was evident in grade 1, but in New Orleans it

FIGURE 6.3

New Orleans Longitudinal Sample CTBS Reading Scores

K to 1st Grade

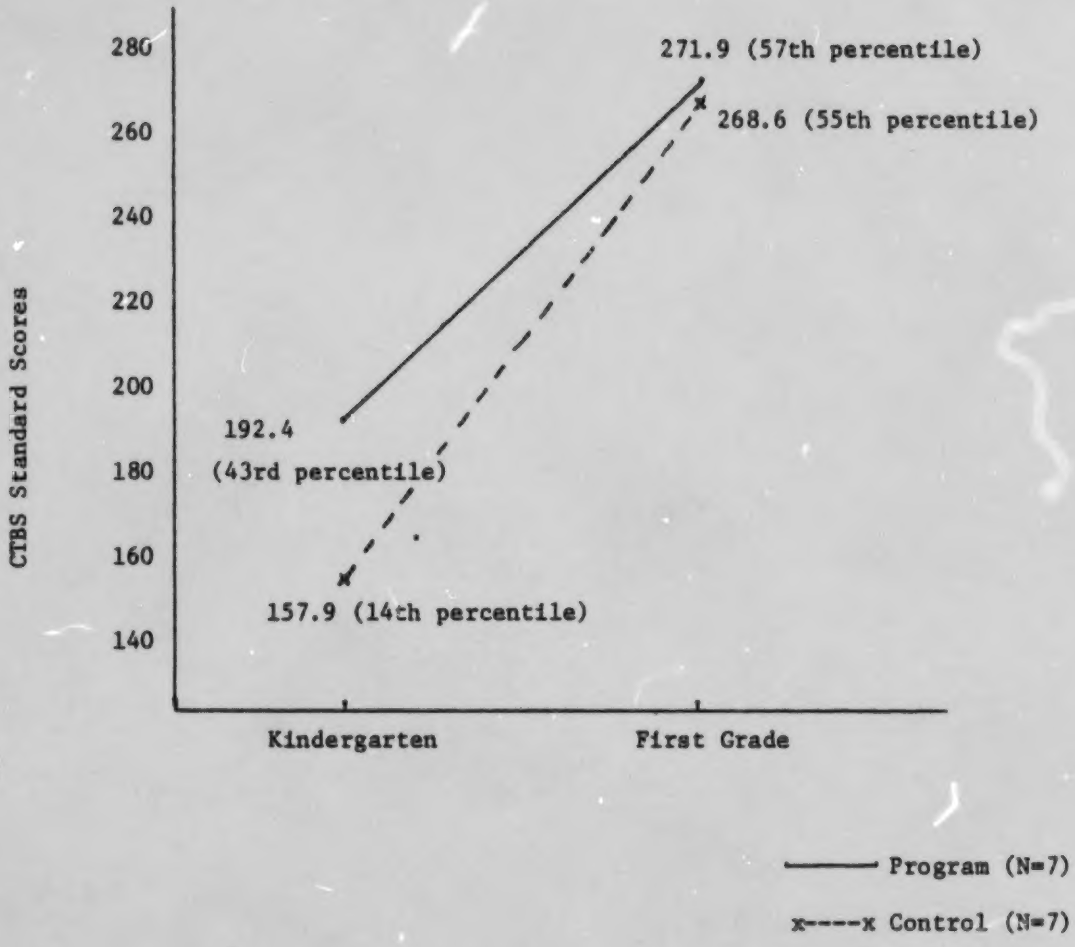
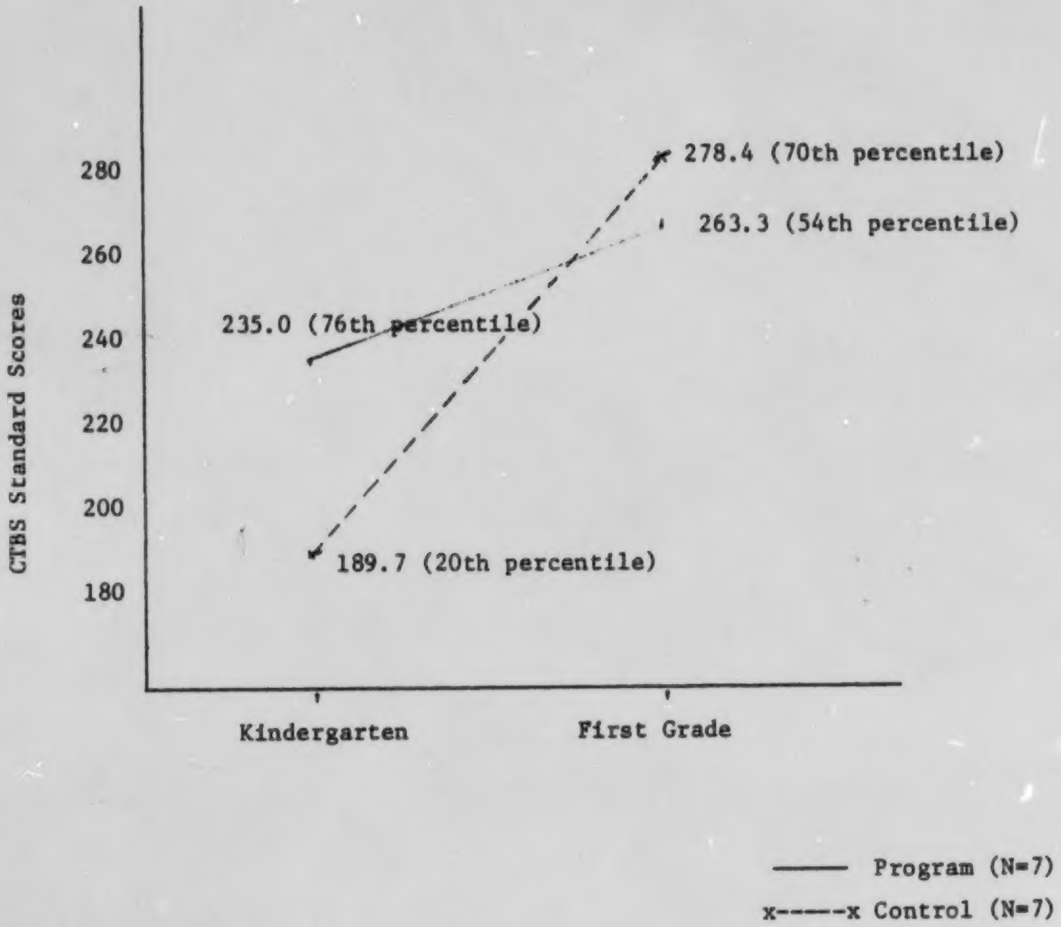


FIGURE 6.4

New Orleans Longitudinal Sample CTBS Math Scores

K to 1st Grade



was limited to kindergarten. Sample sizes for these analyses were extremely small. In Birmingham many potential subjects were not located, and in New Orleans most subjects were located but the potential pool was very small. Further follow-up is clearly needed to determine whether the apparent first-grade effect in Birmingham is replicated as more subjects are located and whether this effect extends into second grade. In New Orleans, another cohort of children will complete first grade next year, and it will then be possible to determine whether the effect there is indeed limited to kindergarten.

Follow-up Interviews

Brief questionnaires were administered to mothers in Birmingham and New Orleans when they brought their children in for follow-up testing. The questionnaires were designed primarily to describe the mother's employment history and indicate any preschool experiences of the target children. Results of the 48-month and 60-month questionnaires administered in Birmingham are presented in this section. New Orleans questionnaire data presented here are limited to a one-year follow-up (child-age 48 months) on the cohort that entered the program in 1975.

Birmingham follow-up questionnaire. Questionnaire responses for the one-year post program (child-age 48 months) and two-year post program (child-age 60 months) time points are summarized in Tables 6.5 and 6.6. Responses of program and control mothers were similar and did not significantly differ in any category. In both groups at both time points about

TABLE 6.5

Birmingham 48-Month Follow-Up Questionnaire

		Program		Control	
		Frequency (N=59)	%	Frequency (N=57)	%
Head of Household	Mother	24	40.7	27	47.4
	Father	20	33.9	20	35.1
	Other added	11	18.6	8	14.0
	No response	4	6.8	2	1.8
Mother Employed	Yes	28	47.5	30	52.6
	No	30	50.9	27	47.4
	No response	1	1.7	0	0.0
Weeks/year Mother Employed	24 or fewer	17	28.8	16	28.1
	25 or more	9	15.3	16	28.1
	No response	33	55.9	25	43.9
Hours/week Mother employed	29 or fewer	6	10.2	12	21.1
	30-39	6	10.2	7	12.3
	40 or more	13	22.0	12	21.1
	No response	34	57.6	26	45.6
Enrolled in Preschool	Yes	40	67.8	28	49.1
	No	18	30.5	29	50.9
	No response	1	1.7	0	0.0
Hours/day in Preschool	3 or fewer	0	0.0	1	1.8
	4 - 8	28	47.3	22	38.6
	9 or more	12	20.3	4	7.0
	No response	19	32.2	30	52.6

TABLE 6.6

Birmingham 60-Month Follow-Up Questionnaire

		Program		Control	
		Frequency	% (N=61)	Frequency	% (N=51)
Head of Household	Mother	29	47.5	29	56.9
	Father	21	34.4	17	33.3
	Other adult	11	18.0	5	9.8
	No response	0	0.0	0	0.0
Mother Employed	Yes	32	52.5	26	51.0
	No	29	47.5	25	49.0
	No response	0	0.0	0	0.0
Weeks/year Mother employed	24 or fewer	11	18.03	11	21.6
	25 or more	21	34.4	15	29.4
	No response	24	47.5	25	49.0
Hours/week Mother employed	29 or fewer	7	11.5	3	5.9
	30-39	8	13.1	9	17.6
	40 or more	15	24.6	12	23.5
	No response	31	50.8	27	52.9
Enrolled in preschool	Yes	50	82.0	44	86.3
	No	11	18.0	7	13.7
	No response	0	0.0	0	0.0
Hours/day in preschool	3 or fewer	0	0.0	1	2.0
	4-8	36	59.0	37	72.6
	9 or more	13	21.3	6	11.8
	No response	12	19.7	7	13.7

half of the mothers were employed. However, of those mothers who were working, the percentage who were working 25 or more weeks per year ranged from about 34% to 65%. The majority of the working mothers worked at least 30 hours per week during the weeks when they were employed.

At 48 months of age, about two-thirds of the program children and half of the control children were enrolled in some kind of group preschool program (including daycare). Only one child was enrolled in a program that lasted fewer than four hours per day. By their fifth birthdays, over 80% of the children in both groups attended preschools. Note that preschool was not merely a babysitting service for working mothers; many nonworking mothers also sent their children to preschool.

New Orleans follow-up questionnaire. Results from the New Orleans follow-up questionnaire are presented in Table 6.7. In both groups, more than half of the mothers were either currently working or had been employed in the preceding six months. The majority of children in both groups were cared for by someone other than their mothers for at least part of the day.

Conclusions. Although striking program-control differences were not noted, the questionnaire results do have implications for the PCDC programs. Many mothers of young children are employed outside the home and social programs designed to help these mothers must take account of this desire and/or need to work. Also, many children will have group preschool experiences after leaving the PCDC but before enrolling in regular school programs. Ideally, PCDC type programs would be dovetailed into more traditional group Head Start programs which would in turn be

TABLE 6.7

New Orleans 48-Month Follow-Up Questionnaire

		Program		Control	
		Frequency	(N=16)%	Frequency	(N=11) %
Are you Working?	Working Now	7	43.8	3	27.3
	Not working now, but did work in last 6 months	3	18.8	3	27.3
	Did not work in last 6 months	6	37.5	5	45.5
What type of work?	Unskilled	7	43.8	3	27.3
	Skilled	1	6.3	1	9.1
	Childcare	1	6.3	0	0.0
	Not working or no response	7	43.8	7	63.6
If working or in school, who keeps children?	Neighbor or friend	1	6.3	0	0.0
	Live-in relative	3	18.8	1	6.3
	Relative outside home	1	6.3	0	0.0
	Daycare or preschool	5	31.3	2	18.2
	Not working or no response	6	37.5	8	72.7
What other educational programs is child in?	Head Start	6	37.5	6	54.6
	Other	0	0.0	0	0.0
	None or no response	10	62.5	5	45.5
Are you in school?	Yes	2	12.5	1	9.1
	No	6	37.5	2	18.2
	No response	8	50.0	8	72.7

linked to the regular school program to foster true developmental continuity from birth through the public school years.

It should be noted that these questionnaires focused on only a few possible impacts of the PCDCs on later family functioning. They did not assess family interaction patterns or child-rearing practices that might have been influenced by the PCDC. Such analyses must await the administration of a truly comprehensive interview during the proposed follow-up study.

Mother-Child Interaction Effects at 48 Months

Birmingham results. Results of the Birmingham mother-child interaction observations at 48 months are presented in Table 6.8. The program-control group differences seen at 36 months in the teaching situation continue to be significant at 48 months (Effective Teacher score). However, the positive maternal behavior score, derived from the waiting room observation, shows only marginal program effects.

There are two hypotheses which might explain these results. First, it is possible that one year beyond the end of the program, non-specific effects on the mother, as measured in the waiting room, are becoming weaker. The mother's teaching behavior, on the other hand, was a direct focus of the curriculum, this behavior may show longer-lasting effects. A second, equally viable hypothesis is that the 6-minute mother-child waiting room observation is not a valid observation setting with children as old as 48 months. Children of this age often play happily and appropriately alone with a toy for several minutes, while the mother observes or reads nearby. Although the teaching situation forces the mother and child to interact, the 6-minute waiting room may simply be too short an observation for critical maternal behaviors to be displayed either positively or negatively.

New Orleans results. Results of the New Orleans mother-child interaction observation at 48 months are also presented in Table 6.8. The program-control group differences seen in the 36-month waiting room have become considerably weaker at 48 months. All of the mean differences are in the appropriate direction, but only differences in negative language are significant. As in the Birmingham results, it is possible that a short (10-minute) waiting room observation is simply not an appropriate instrument for observing mothers interacting with their 4-year old children. The large standard deviations in language frequency scores in Table 6.8 partially reflect the fact that many mothers interacted minimally with their children during the observation. In addition, the N of the New Orleans 48-month sample is small; with the large standard deviations a more sizeable sample would be needed for the results to show significant group differences.

There is some question about how long to expect program mothers' behaviors toward their children to be affected by the PCDC programs. At a concrete level, it would be unlikely that behaviors learned by mothers as appropriate for one-year-olds would carry over to school age children. However, to the extent that the PCDC programs emphasized more general concepts of child rearing--such as use of language, supportiveness,

TABLE 6.8

Maternal Behaviors on Mother-Child Interaction Observations

48-months

		Program	Control	t
BIRMINGHAM				
Positive Maternal Behavior (waiting room)	N	72	69	
	M	54.32	45.71	1.70+
	SD	30.49	29.44	
Effective Teacher (structured teaching)	N	69	68	
	M	12.67	10.87	3.62**
	SD	2.98	2.87	
NEW ORLEANS				
Net Positive Maternal Language (waiting room)	N	17	23	
	M	12.65	4.00	< 1
	SD	38.34	38.80	
Positive Maternal Language (waiting room)	N	17	23	
	M	70.35	66.35	< 1
	SD	17.53	17.74	
Negative Maternal Language (waiting room)	N	17	23	
	M	6.88	17.22	-3.07**
	SD	7.87	12.10	
Sensitivity (waiting room)	N	17	23	
	M	6.06	4.96	1.68+
	SD	1.85	2.18	
Acceptance (waiting room)	N	17	23	
	M	7.18	6.17	1.86+
	SD	1.38	1.87	

**p<.01 + p<.10

TABLE 6.9

Regressions of Background Variables on Selected Maternal Variables from Mother-Child Interaction Observations

48-months

INDEPENDENT VARIABLES	BIRMINGHAM				NEW ORLEANS			
	Positive Mat. Int. (df=117)		Effective Teacher (df=115)		Positive Language (df=25)		Negative Language (df=25)	
	Weight	t	Weight	t	Weight	t	Weight	t
(1) Child's sex[1]	5.34	.99	.54	1.34	-.06	-.01	2.57	.72
(2) Mother education	2.25	1.10	.03	.18	-1.74	-.84	-1.16	-1.11
(3) Mother age	1.13	1.09	.13	1.63	-1.32	-2.39 *	.46	1.65
(4) No. of children	-6.69	-2.03 *	-.38	-1.53	2.46	.72	-4.70	-2.73 *
(5) Father presence[2]	6.80	1.12	.40	.89	16.50	1.90	-3.20	-.73
(6) Mother WAIS[2]	—	—	—	—	-.04	-.09	-.23	-.98
(7) Treatment[3]	14.41	2.65*	1.79	4.38**	15.47	2.16*	-17.22	-4.80**
MULTIPLE R[4]	.37		.45		.51		.73	
INTERACTIONS								
1 X 7	-3.06	-.28	-.48	-.59	-3.28	-.26	-10.51	-1.72
2 X 7	1.37	.40	-.05	-.17	3.37	.90	-.54	-.28
3 X 7	.78	.61	-.01	-.12	3.53	2.46*	-.40	-.50
4 X 7	1.27	.27	.06	.18	6.22	.88	.65	.18
5 X 7	12.70	1.10	.49	.58	-.36	.02	-5.04	-.55
6 X 7	—	—	--	--	-.43	-.42	-.49	-.97

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*p .05
**p .01
1 Male=1 Female=2
2 Presnet=1 Absent=2
3 Sum of 3 scale scores from Wechsler Adult Intelligence Scales: Vocabulary, Similarities, Comprehension
4 Multiple R after adding all independent variables, but excluding interactions.

positive reinforcement, etc., these behaviors were expected to carry over as the children got older.

Regressions of background variables on selected 48-month maternal variables are presented in Table 6.9. In both sites significant treatment effects emerge when the background variables are statistically controlled.

Summary

Although there was no evidence of long-term effects of the PCDCs on general cognitive ability, there was some evidence suggesting an impact on school achievement. However, samples for these school analyses were very small and further follow-up study is needed as more PCDC graduates progress through the school system. There was some evidence that effects on maternal behaviors, as assessed by the mother-child interaction tasks, persist at least one year after graduation from the programs. This was particularly true for the measure of maternal teaching behaviors used in Birmingham. Unfortunately, longer-term measures of program impact on mothers were not available. Further follow-up is essential to adequately evaluate the long-term impact of PCDCs on mothers and their children.

Chapter 7

Replication Sites: Short-Term and Long-Term Effects

The original plan of the PCDC project included an elaborate design for the replication study, which was the second phase of the project. Each one of the original models, developed in Birmingham, Houston, and New Orleans, was to be replicated three times in different sites with different populations. Furthermore, an external evaluator was to design and implement an evaluation of all replication sites as well as continue following new cohorts and previous graduates of the original sites.

In 1975, the first replication of the Birmingham model was established in Indianapolis. It was followed shortly by San Antonio, the Houston replication, and the Merrill-Palmer or Detroit PCDC, based on the New Orleans model. The first wave of replications was funded by the Eli Lilly Foundation; they agreed to fund the three replication sites for three years in conjunction with federal funds for the original sites.

Schedule problems in the grand plan developed almost immediately. Bank Street College of Education was funded in 1975, also by Lilly, as a Replication Management Organization (RMO). However, the original plan called for the Office of Child Development (OCD) to fund the external evaluation at the same time. Almost three years passed before the Educational Testing Service was awarded the contract as the external evaluation agency. During this period a number of carefully laid plans began to unravel.

In the absence of an external evaluation, the federal project officer, Mary Robinson, was forced to continue funding the original evaluation staffs on an interim, much reduced level. This stop-gap measure did not allow for coordinated data collection in the replication sites. Miss Robinson requested each of the original sites to "find any means possible" to collect entry data in their replication sites. Needless to say, the distances involved, the lack of a local replication site evaluation staff, the limited budget, and the uncertainty of the duration for this situation seriously reduced the effectiveness of the replication site evaluations.

Had these been the only problems the outcomes would have been far greater. The fact was that two of the replication sites, Indianapolis and San Antonio, experienced early difficulties in stabilizing the program treatment. Despite this, early entry data were collected in both sites. However, by design both sites started up with less than the complete treatments. Therefore, early data are of limited usefulness in the outcome evaluation.

By the time these implementation problems were resolved, a new and more difficult set of problems developed. The Lilly Foundation funding was expiring in 1978. Funds were scarce all over. The Indianapolis PCDC was forced to rely on Title XX funds with matching monies from Lilly. Although this kept the center open, it created major difficulties for the evaluation. Recruitment of a control group, randomly assigned, from Title XX eligible mothers was not possible, as the PCDC was forced to serve all who came. Thus, the Indianapolis PCDC is still in operation, but there are no data on its effectiveness. Even though there is no evidence of child or mother impact; there are informal observations from Bank

Street staff attesting to the faithfulness of the replication to the original Birmingham model.

The San Antonio PCDC experienced similar problems. When Lilly support ended, they received some Title XX funds that were matched by the Hogg Foundation. Unfortunately, however, it was very difficult to get the necessary state funding and after a couple of years of barely keeping the program intact, the San Antonio PCDC was forced to close. Some entry data was gathered by the Houston research staff, but little data was collected on graduates.

The Detroit PCDC was more fortunate; their funding was picked up by the Charles S. Mott Foundation, which generously supported the program until 1980. It is largely due to the Mott Foundation's support that any data from the replication sites can be reported. The Detroit PCDC at the Merrill-Palmer Institute was a true replication of the New Orleans model, closely duplicating the various program components, and, in some instances, with higher quality than its parent site. Unfortunately, when the Merrill-Palmer Institute closed its doors in 1980, the PCDC was also forced to close.

The remaining sections of this chapter present the data from the first two cohorts of the Detroit PCDC. Cohort 1 entered in 1976 and graduated in 1979; Cohort 2 spanned the three-year period from 1977 to 1980. Several categories of analysis are presented. First, the data are examined for the possibility of differential attrition. Second, short-term program effects on the child and the mother at graduation are presented using parallel analyses to those reported in the earlier chapter on short-term effects in the original sites. Finally, long-term effects are reported for Cohort 1. Children in this cohort were 48 months old when the project was terminated.

Detroit Demographic Characteristics and Attrition Analysis

Results of the analysis for differential attrition are presented in Table 7.1. Selected demographic characteristics were compared for program and control families who remained in the sample until the completion of the 36-month test battery. The final sample was defined by having a score on the Stanford-Binet at graduation. The differences between groups in the final sample were tested with *t*-tests for continuous variables and chi-squares for the dichotomous ones. For comparison, entry scores on these same variables for program and control families that dropped out are also included in Table 7.1.

There is no evidence of differential attrition that would bias the results on entry demographic variables including income, mother's education, mother's age, number of other children in the family, and father presence. However, the sex balance in the final sample was significantly unequal. The program group was predominantly female while 69% of the control group was male. It is not possible to estimate the full impact of this discrepancy on the evaluation results, but the fact that there were no sex differences on any of the outcome measures suggests that any bias may be minimal.

The Detroit sample can be described as low-income, urban black women, many of whom did not finish high school. They were approximately

TABLE 7.1

Detroit

PCDC: Attrition Analysis - Stanford-Binet Scores

36-months

Entry Demographic Variables		Drop		Final Sample		
		Program	Control	Program	Control	t
Income	N	30	27	20	12	
	M	1494.43	1803.96	1809.40	1739.83	.20
	SD	949.98	1204.45	851.80	1113.23	
Mother's Education	N	32	29	20	13	
	M	11.19	11.31	11.25	11.54	-.59
	SD	1.06	1.17	1.62	0.88	
Number of Children in Family[1]	N	32	29	20	13	
	M	1.72	2.41	1.35	2.31	-1.44
	SD	1.40	2.49	1.35	2.46	
Mother's Age	N	32	29	20	13	
	M	22.63	22.86	22.55	24.92	-1.26
	SD	4.38	4.83	5.51	4.96	

										Chi-Square
Father present	N (%)	9	(28)	10	(26)	3	(15)	3	(23)	.34
Father absent	N	23		29		17		10		
Male	N (%)	26	(49)	24	(47)	7	(33)	11	(69)	4.56*
Female	N	27		27		14		5		
TOTAL		53		51		21		16		

*p<.05

[1] Number excludes target child.

23 years old and had one to three other children besides the PCDC target child. Fathers were present in only about 18% of the homes.

Short-Term Effects

Child effects. The Stanford-Binet (1960 norms) and the Concept Familiarity Index (CFI) were administered to children at graduation, as in the three original sites. Table 7.2 contains the results of the analyses separately for Cohorts 1 and 2 and for the combined sample. Even though the Ns are small, owing to the relatively briefer period of program operation, there is a significant difference between the groups for the combined sample on both measures ($p<.05$).* Cohorts 1 and 2 have been presented separately because there seems to be a genuine difference between the two in the overall effectiveness of the program.

Speculation as to why the second cohort results were not as strong as Cohort 1 is somewhat limited by the fact that the Cohort 2 children were not old enough for the 48-month tests. However, the second cohort coincided with considerable turmoil and confusion at the Merrill-Palmer Institute during its final days. Although the first cohort received strong support from the Institute, the second did not.

Examination of the Cohort 2 control group scores suggests another explanation. The lack of significant differences between the groups is more a matter of the high scoring controls than the fact that the program

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*As a replication site, the direction of effects could be more confidently predicted. Therefore, one-tailed hypothesis tests were used.

TABLE 7.2

Stanford-Binet IQ (1960 norms) and Concept Familiarity Index Scores

36-months

		Cohort								
		1			2			Combined		
		Program	Control	*t*	Program	Control	*t*	Program	Control	*t*
	N	9	9		12	7		21	16	
SB 36	M	114.0	101.56	1.86*	110.92	106.71	<1	112.24	103.81	1.80*
	SD	13.53	14.82		12.34	17.73		12.63	15.81	
	N	7	8		10	7		17	15	
CFI 36	M	36.0	28.13	2.60**	35.5	34.0	<1	35.71	30.87	2.15*
	SD	6.86	4.82		5.56	7.77		5.92	6.83	

Note. One-tailed probability values are used because the direction of effect was predicted a priori

* $p < .05$
** $p < .01$

children did not score enough. All of the Stanford-Binet tests were administered by the same tester, a highly trained black professional from the Bank Street College Follow-Through staff. She had no knowledge of group membership. One source of bias, however, could be in the selection of cohort 2 controls for testing. During the last two years that the program children were attending the PCDC, there was no contract with the control group. It is possible that those who were located after two years and were willing to come in for a testing appointment were less anxious about how their children would perform than mothers who chose not to participate.

Nonetheless there is a strong 9-point difference on the Stanford-Binet between the program and control groups at 36 months. This difference is reinforced by the CFI findings. Regression analyses of the background variables on the Stanford-Binet parallel to those reported earlier were performed. Because of the small sample size, only three background variables were used. The resulting regression weights and $\underline{t}$ statistics are shown in Table 7.3.

There is a general lack of relationship of these variables to the IQ scores. A major factor in this lack of relationship is undoubtedly the relative homogeneity of the sample, which tends to attenuate relationships. Only one variable by treatment interaction (father presence X treatment) approached significance ($\underline{p}<.10$, two-tailed). This finding was in the direction of suggesting that the treatment was more effective (higher IQ scores) for program children whose fathers were absent.

TABLE 7.3

Detroit

PCDC: Regression of Background Variables - Stanford-Binet IQ

36-months

	Independent Variables	Stanford-Binet	
		Weight	t
(1)	Child's sex	1.33	.21
(2)	Mother's education	2.95	1.36
(3)	Father presence	-2.83	-.36
(4)	Treatment	8.57	1.38
	Multiple R	.38	
	Interactions		
	1 X 4	-11.71	-.85
	2 X 4	-8.71	-1.58
	3 X 4	-31.17	-2.02+

Note. The df for the t statistics is 25.

+ $p<.1$, two-tailed

Mother effects. Mother-child interaction observations were collected on the sample of program and control mothers at graduation. The New Orleans research staff assumed responsibility for the standardizations of the interaction setting and coding of the videotapes to ensure comparability with the data presented on the New Orleans MCI.

Table 7.4 presents the results, again for Cohorts 1 and 2 separately and combined. For Cohort 1, a number of individual variables approached significance, small N notwithstanding, and might have produced a significant difference had the sample size permitted the use of multivariate statistics. All of the variables were in the predicted direction.

Cohort 2 results were not nearly as impressive with only positive language having a t greater than one. For the combined cohort results only, use of positive language approached significance.

Conclusion. It is interesting to note that the Detroit results, compared with New Orleans, are relatively stronger at graduation for the children than for the mothers. We are somewhat at a loss to explain this. However, Bank Street staff report that the Detroit PCDC developed a much better learning environment for the children than did New Orleans. The children's program in Detroit usually had a smaller staff-child ratio and the actual physical building, if not the staff, was better equipped to provide the children with a stimulating program.

Long-Term Effects

The report of long-term effects in Detroit is limited to the 48 month testing of mothers and children from Cohort 1. A mother-child

TABLE 7.4

Detroit

PCDC: Mother-Child Interaction Observations Means

36-months

		Cohort								
		1			2			Combined		
Variables[a]		Program	Control	t	Program	Control	t	Program	Control	t
N		6	6		12	7		18	13	
IS	M	7.7	6.5	1.3+	6.8	6.7	<1	7.1	6.6	1.1
	SD	1.2	1.8		1.1	1.1		1.2	1.4	
RA	M	8.3	7.3	1.2	7.4	7.3	<1	7.7	7.3	<1
	SD	0.8	1.9		1.2	0.5		1.1	1.3	
IC	M	6.5	5.3	<1	5.4	5.3	<1	5.7	5.3	<1
	SD	2.6	2.3		1.7	1.4		2.0	1.8	
POS L	M	90.8	82.3	<1	85.1	77.1	1.3+	87.0	79.5	1.5+
	SD	6.1	20.8		13.6	12.6		11.8	16.3	
ICL	M	50.3	54.3	<1	67.2	59.6	<1	61.2	57.2	<1
	SD	21.5	14.1		17.2	17.7		20.0	15.8	
NEG L.	M	7.3	14.2	-1.5+	8.4	8.0		8.1	10.8	-1.2
	SD	8.3	7.1		5.8	5.4		6.5	6.8	
NET L.	M	33.2	13.8	1.1	11.6	9.6	<1	18.8	11.5	<1
	SD	31.4	29.2		20.5	30.7		28.1	28.8	

NOTE. All comparisons are one-tailed or direction of effect was predicted a priori.

[a] Variable labels are: IS=Sensitivity rating; RA=Acceptance rating; IC=Cooperation rating; POS L=Positive language; ICL=Initiation control language; NEG L-Negative language; NET L=Net language.

+$p<.10$

interaction observation was obtained on the same day the Stanford-Binet was administered to the children.

Child effects. The follow-up results on the Stanford-Binet are shown in Table 7.5. The program group retains its superiority to the control group, with a mean difference of 10 IQ points ($p<.05$). The program children showed an increase from 114 to 116, and the control children increased from 101 to 106. In the absence of evidence to the contrary, we must cautiously conclude that, as with the 3 original sites, IQ effects persisted for at least one year after graduation.

Mother effects. The results from the 48-month mother-child interaction observation are strikingly positive. As can be seen in Table 7.6, there are significant program/control group differences on four of the seven variables; two more approach significance. It is surprising that the 48-month MCI differences are stronger than those observed at graduation. One could hypothesize that the relatively more sophisticated northern urban mothers needed some time to assimilate what they had learned. The Detroit PCDC program also had an impressive counseling program for its graduates, which the New Orleans PCDC never implemented. They helped mothers find jobs, child care, or good nursery schools for the children upon graudation. The 48-month MCI results may be the fruits of this effort.

Conclusion. The Detroit PCDC was in operation only long enough to produce two cohorts of graduates. Although the program effects appear to be stronger for the first cohort than for the second, the IQ scores and

TABLE 7.5

Detroit

PCDC: Follow-Up Stanford-Binet IQ Scores

48-months

		Program	Control	*t*
Stanford-Binet	N	9	7	
	M	116.78	106.14	2.27*
	SD	9.40	9.17	

Note. Comparison is one-tailed as direction was predicted a priori.

* $p<.05$

TABLE 7.6

Detroit

PCDC: Follow-Up Scores on Mother-Child Interaction

48-months

Variables		Program	Control	t
Mother-Child Interaction:				
Insensitivity-Sensitivity	N	7	7	
	M	6.9	5.1	2.2*
	SD	1.3	1.6	
Rejection-Acceptance	N	7	7	
	M	7.6	6.1	2.6**
	SD	0.8	1.2	
Interference-Cooperation	N	7	7	
	M	5.9	4.3	1.5*
	SD	1.8	2.1	
Positive Language	N	7	7	
	M	88.9	82.9	1.6+
	SD	7.9	6.1	
Initiating Control Language	N	7	7	
	M	50.5	73.3	-2.4**
	SD	22.7	9.7	
Negative Language	N	7	7	
	M	7.7	10.6	<1
	SD	7.8	7.1	
Net Language	N	7	7	
	M	28.4	-1.0	2.1*
	SD	30.1	21.0	

All comparisons are one-tailed as direction was predicted a priori.

+$p<.10$

*$p<.10$

**$p<.05$

CFI scores for the combined cohorts indicate that the program was successful in attaining the desired child effects at graduation. The effects are maintained, and in fact, are stronger for the first cohort one year after graduation when significant mother-child interaction effects also emerge.

Chapter 8

Summary and Discussion

The major findings have been reported in earlier sections, organized by short-term effects, long-term effects, and the effects from one replication site. In this summary, we attempt to present an integrated picture of the PCDC experience for mothers and children. Account is taken of the differences in the models and in the participants of the four sites. To complete the picture, other events in the participants lives, when these events are known, are included into the discussion. A second section is devoted to a discussion of the characteristics of families who benefited from the programs and the limits of generalizability to future populations. The final two sections address the questions: (1) Did the PCDC experiment meet its goals? (2) What are the implications for future programs, research, and social policy?

Summary of Findings

The three original sites, Birmingham, Houston, and New Orleans, began operation in 1970-71. Dates presented in this report have been aggregated over an eight-year period encompassing two phases (1972-1975 and 1976-1980). New Orleans and Houston completed data collection on several cohorts of graduates, four and seven, respectively. The Birmingham model was designed so that small numbers of mothers were recruited continuously, and therefore that model does not have identifiable cohorts. Data on two cohorts from the Detroit replication site are also included and will be discussed in this section as another example of the general PCDC model of parent education. The total PCDC sample approaches 300 program and 250 control mother-child dyads who completed program and data collection activities.

The overall findings at program graduation, when the child reached 36 months, are impressive. Program mothers and children, across all sites, were significantly different from their controls on most major evaluation measures. The first strong pattern of effects favoring the program groups began to appear at 24 months. Houston mothers were, of course, just entering the program at that time. The major purpose of this report is to evaluate the effects of the PCDCs at graduation and the retention of those effects after graduation. Therefore only limited data are presented from the time points prior to 36 months.

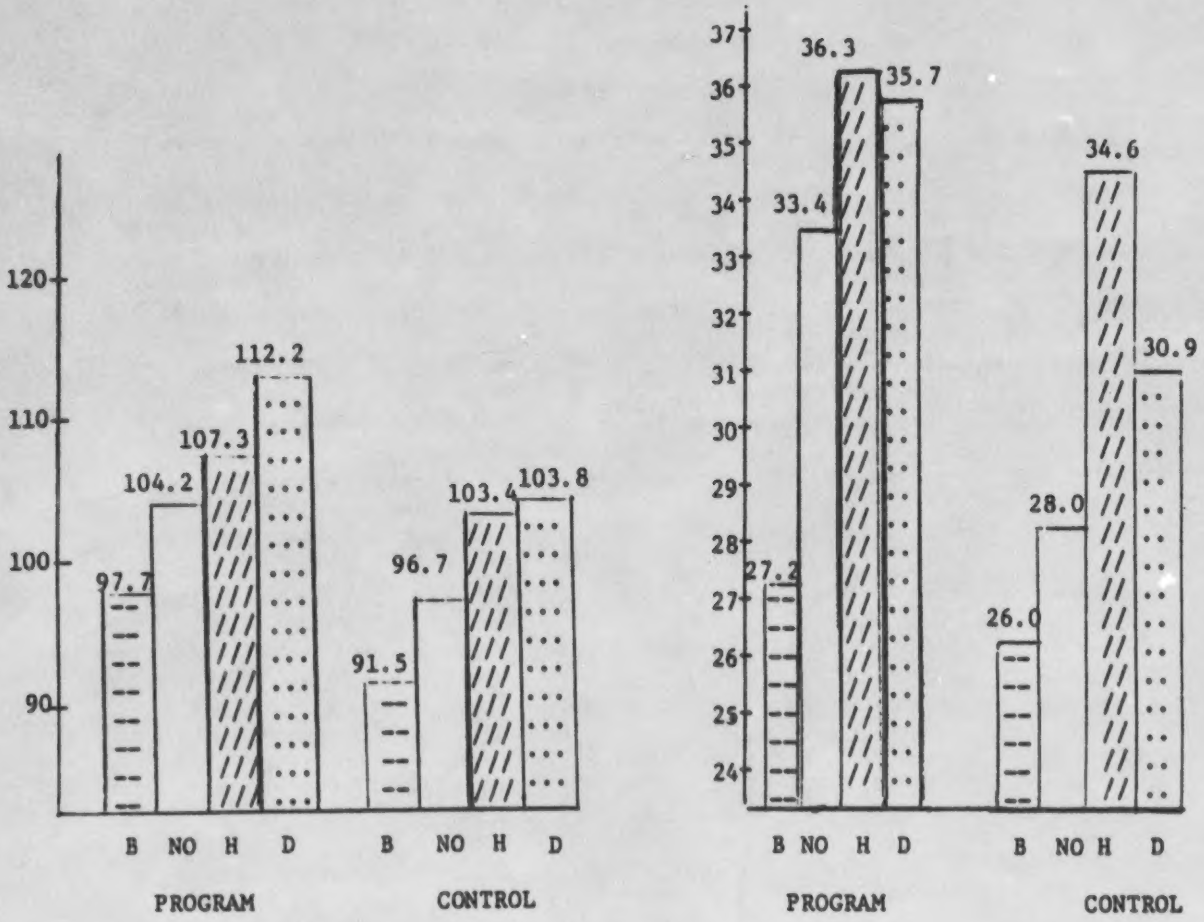
When the children were 24-months-old, program/control differences on the Bayley Scales of Infant Development significantly favored program children in the three original sites. (The Bayley was not administered to children in the Detroit replication site.) New Orleans and Birmingham children and their mothers had been in the programs two years at that point, but Houston mothers had only completed one year. Furthermore, the first year of the Houston program was composed of approximately 30 home visits that minimally involved the child. Because there were no Houston differences on the Bayley at entry (12 months), the six-point difference at 24 months (97.6 vs. 91.0) can be interpreted as evidence that the program effects on the child were, at least in part, mediated through the mother.

A summary of the results of the 24-month mother-child interaction observations confirms that mothers were indeed interacting with their children differently than were control mothers. The only summary variable that was not significant was Net Positive Maternal Behavior from Houston (see Table 5.13). However, the HOME Scale total score, which combines both physical environment factors in the home setting (e.g., provision of appropriate play materials) with judgments of observed interaction (e.g., such as the mother's verbal responsiveness) did distinguish program and control mothers.

Evidence of program effects at graduation is strong. Children in all four sites received the Stanford-Binet (S-B) and the Concept Familiarity Index (CFI). Stanford-Binet differences all favored the program groups; however, CFI program/control comparisons were significant only in New Orleans and Detroit. This is an interesting finding since Houston was the only program to employ the Palmer concept training curriculum. The Birmingham program engaged mothers specifically in concept teaching activities with their children. The New Orleans model was much less intense and less structured as far as child concept training is concerned. If the significant differences were limited to one site or even two unrelated ones, the finding could be explained on the basis of intersite testing idiosyncracies. However, testers in all four sites were trained by the same person from Palmer's original staff. Furthermore, Detroit was not just similar to but a very close replication of the New Orleans program model. It is possible that some specific New Orleans model characteristic encouraged concept formation in the children.

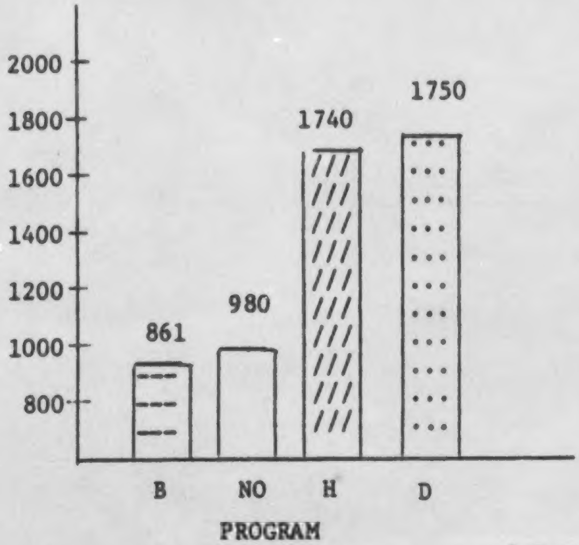
Despite the fact that program children in all four sites performed significantly better on the S-B than the control children, the size of the differences and the relative standing of the group means differed across sites. Houston differences were the smallest (4 points), and Detroit program/control differences were the largest (8 points). New Orleans and Birmingham program children scored on the average of 7 and 6 points, respectively, higher than their controls. Figure 8.1 displays group means for program and control groups by site on both measures. There is a tendency for group means to rank order themselves by site with Birmingham scores consistently the lowest and either Houston or Detroit the highest. This could reflect sample differences or very consistent differences in testing standards. Although the latter explanation is possible, the fact that often different testers in the same site administered these two tests argues against it. On the other hand, there are clear and consistent sample differences. Both the Birmingham and New Orleans sample were low-income black families from southern cities of average size. Other characteristics such as mother's education (11th grade), mother's age (22 or 23 years), percent of fathers present in the home (30-33%) and per capita income ($861-$980), were all very similar. By contrast, Houston families were low-income Mexican-American in a rapidly growing southwestern city. Mothers had an average of a 6th-grade education and were 28 years old, and 94% of the families included the father. Detroit families were more like Birmingham and New Orleans than Houston on all dimensions except income--education = 11 years, age = 24 years, father presence = 15%. The bar graph in Figure 8.1 for income looks strikingly similar to those for the S-B and CFI group means.

FIGURE 8.1



STANFORD-BINET (36)

CONCEPT FAMILIARITY INDEX



PER CAPITA INCOME

The program mothers, at graduation, were observed in both structured-teaching and waiting-room settings and, in the case of Houston, in home settings. Summary scores derived from these observations were all highly positive and significantly different, favoring the program groups in the original sites (see Tables 5.11 and 7.4). Direction and magnitude of effects can hardly be compared across sites because of a variety of reasons ranging from differences in settings to differences in behaviors coded and variables derived. One possible exception is the New Orleans and Detroit results that are based on a similar setting, identical scoring procedures, and the same coder. In this comparison, the Detroit findings are not as strong as those from New Orleans; however, the Detroit sample size is less than one-half as as a result of its relatively shorter period of operation. The percentages of observed occurrence of the variables, however, is fairly consistent between the two sites.

Although the wide-scale application of mother-child interaction observations as the primary measure of program effects is a major contribution to program evaluation, the absence of standards and norms makes their meaning in a more general sense impossible to discuss. For example, whereas most people can interpret a Stanford-Binet IQ of 120 relative to one of 80 in a meaningful way, there is no comparison standard with surplus meaning for a score of 30% on the Positive Maternal Language variable. One can, however, compare program-group and control-group means of 30% and 7%, respectively. We know that program mothers used positive language 30% of the time that they were observed, whereas control mothers used positive language only 7% of the time. We know this difference was statistically significant, and that Positive Maternal Language at 36 months is related to the S-B at 36-months (.33, N = 60). But we have no idea if this is a high or low percentage of positive languages in other samples or in the general population. None the less, the measures do have internal validity and acceptable reliability. Furthermore, they represent not only a considerable investment in resources for measurement development, but a creative approach to parent education evaluation.

In sum, at graduation, there was considerable evidence that the PCDC programs had the desired effects on criterion measures of parenting behavior and child intellectual development. In addition, these effects are all the more impressive by virtue of the differences in measures, samples, and program components. Indeed, these programs seemed to be effective even though not all graduated mothers attended regularly.

Once graduated, PCDC mothers and children were evaluated once a year. Some of the earliest graduates are now in the first and second grades in school. Early PCDC conceptualizations placed great store in the long-term retention of effects. Recent findings, such as those from the Consortium for Longitudinal Studies (1978) have somewhat reduced these expectations.

Mother-child interaction observations were available for New Orleans, Birmingham, and Detroit at one year after graduation. Houston did not collect 48-month data on graduated mothers. The Detroit sample was small as only the first cohort had reached the first follow-up age marker by the conclusion of the experiment. Birmingham observations included both structured teaching and waiting-room settings, and New Orleans and Detroit observations were from the waiting-room situation.

According to the original PCDC model conceptualizations, retention of effects by the child should be mediated by the mother. Therefore, some evidence of retention of facilitating interaction techniques on the part of graduated mothers was expected. In fact, mothers in all three sites did show some retention of effects although the strength of the findings is generally weaker than at graduation. Relative to the controls, Birmingham mothers maintained their superiority in their use of Effective Teaching Behaviors. The waiting room Positive Maternal Interaction variable failed to reach significance. The Birmingham Positive Maternal Interaction variable is composed of a number of discrete behaviors, such as facilitates child's activity, play activity with child, and looks at child, which may be more indicative of good interaction with younger children. On the other hand, the children are just reaching a good age for the teaching task and the Effective Teacher variable may be more appropriate.

New Orleans program mothers were observed using more positive behaviors than controls, but only the difference between the groups in the use of Negative Language was significant. Program and control mothers in New Orleans were using the same percentages of positive language and controlling language (suggestions, commands). It has been suggested that the interaction waiting-room setting was getting old to all these mothers, since by 48 months they had all been videotaped in the same small room at least six times. This is not true of the Detroit mothers who were observed only twice. It is encouraging, however, that program mothers were using significantly less language to restrict, criticize, or scold one year after graduation than controls. One possible contributing factor could be that the four-year old program children were doing less to cause their mothers to respond to them negatively.

By contrast, the 48-month data for Detroit graduates looks even stronger one year later than it did at graduation. The mothers differed significantly from the controls on six of the seven variables (see Table 7.6). The sample size was small and should be interpreted carefully; however one program factor specific to Merrill-Palmer may account for these findings. The Merrill-Palmer PCDC had an impressive counseling program for its graduates that none of the other sites had. They helped mothers find jobs or get back in school, get into child care programs or get into good nursery schools as they finished the program. These efforts may be the bridge between the program and later life circumstances needed to obtain strong retention of effects.

In general, the program children maintained their superiority to the controls for at least a year after graduation. The significant program/control differences disappear at 60-months. (Detroit graduates are not that old at this writing.) Often the shrinking of group differences are more a function of the increasing control of the children's scores than the dropping of the program children's scores. One factor which may be important after graduation is whether the child is enrolled in preschool. Data were available in Birmingham to examine this hypothesis. The results of several analyses seemed to indicate that preschool attendance did have a significant effect on IQ scores at 60 months, but that some of the effect can be accounted for by differences in families that choose to send their children to preschool. More children who scored well on the 24-month Bayley (on which there were PCDC treatment effects) choose to send their children to preschool.

The 60-month IQ scores correspond in time to the child's entry into kindergarten. Although there are no group IQ differences at this point, New Orleans program children scored substantially higher on prereading and mathematics achievement tests. Birmingham program children scored significantly higher on first-grade mathematics achievement tests. Second-grade test scores are not yet available.

This differential performance resulted in over half of the New Orleans control children being placed in Title I compensatory education programs, whereas none of the New Orleans program children were. This finding alone is a remarkable "preventive" effect. However, scores on the same sample of children at first and second grade highlight an old familiar issue in intervention evaluation. The control children, many of whom were in Title I, caught up with the program children, who were not in special programs.

So we are left with an issue--which is more effective, prevention or amelioration? But the issue is quite complex. We do not know the later relative advantages of a comprehensive preventive program such as PCDC on such factors as school achievement in later grades, attendance patterns, high school drop out, college attendance, teenage pregnancy, mental health, trouble with the law, job success, and a host of other variables not strictly related to IQ and school achievement. On the other hand, the short-term costs of the Title I type programs is considerably less than the PCDC costs. The long-term costs and benefits are still a matter of conjecture. It is worth noting that there is no evidence on the effectiveness of Title I programs to suggest that one year of such a compensatory program is significant to counteract deficits accumulated over the entire first five years of life.

Characteristics of Participants

Obviously programs such as these are not suited to everyone. It would be useful to know what kinds of participants seem to derive the most benefit. To this end a number of background characteristics were included in a set of multiple regressions on the mother-child interaction variables at 24, 36, and 48 months and on the child IQ scores at 24, 36, 48, and 60 months. Treatment was included as a predictor variable with sex of child, mother's age and education, number of children, number of rooms per person, and father presence in the home. There were only four or five significant interactions between any of the moderator variables and the treatment out of over 150 such comparisons. No pattern was discernible to indicate that older or younger mothers or children with fathers present, or mothers of boys or girls, benefited more from the programs.

It must be remembered that the four PCDC samples represented an extremely limited range within each sample. All mothers were in the low-income group; most had not finished high school, and few were under

17 or over 26 years of age. The restricted variance undoubtedly attenuated the relationships.

We do know, however, that a relatively small percentage of all mothers recruited in all sites actually graduated. This was more true for the program than for the control mothers, although the attrition in the control groups was typically over 50% also. Both program mothers and control mothers were self-selected volunteers, although this is less of a program than it might seem because any participant in any future program will necessarily have to be a volunteer.

There are two different kinds of problems with attrition. Differential attrition is a problem of internal validity in any study. There was no evidence that different types of program mothers dropped out of the study than did control mothers. But sheer amount of attrition and the fact that only 50 or 60% of all mothers contacted agreed to participate from the outset speaks to the issue of external validity. We know very little about those who refused any participation. We do know that most of the program and control mothers who dropped out after some period of time did go to work, begin a training program (such as WIN or CETA), or return to school. This was not the case in Houston. The Mexican-American families were largely intact, with the father working, and mothers were discouraged from going to work or to school. Instead, most of the Houston attrition is attributable to the fact that they were more upwardly mobile, many families moved out of the area of the center and had to stop coming because of transportation problems in Houston, which is a sprawling metropolis.

Follow-up questionnaires in Birmingham and New Orleans bear testimony to the numbers of women who are returning to the job market. Approximately 50% of the program mothers who stayed in the program groups, (e.g., did not work during first three years of the child's life) were working one year after graduation. In New Orleans, an additional 12% of the graduates returned to school after the program. Together, these account for approximately 60% of the graduates.

In conclusion, the pressures women feel to get a job or return to school caused a number of mothers to drop out of the programs in New Orleans, Birmingham, and Detroit. These pressures were probably both internal and external. At least two implications about program development and evaluation can be drawn from this. Future programs should be designed to take account of these needs. Programs could be more intense over shorter periods of time, and program content should include basic skills and job counseling, as well as counseling on good child care alternatives for working mothers. In terms of evaluation, more needs to be learned about drop outs. Information on the kinds of jobs both dropouts, graduates, and control mothers obtain should be gathered. How long they keep the jobs and advancement are also useful pieces of information. It is possible that dropping out of programs to obtain a job is a positive program effect, particularly if the program had anything to do with the mother's getting and keeping the job and if it is a good job for her.

Did the PCDC Experiment Meet its Goals?

There were two original main purposes to the PCDC experiment:

1. To enhance the development of young children and offset the educational and occupational problems associated with poverty.
2. To demonstrate a strategy for program development, evaluation, and dissemination to inform social policy.

Each of these goals includes several complex layers of goals. Many of the goals were measured; some were not. There were also changes in the relative importance of goals over the course of the experiment as well as new goals added. The two main goals will be discussed separately along with implications for social policy.

To enhance the development of low-income children. In addition to goals for the child, both at graduation and over the long-term, there were program goals for mothers. Mothers were seen as the major intervention agents, and it was hoped that by increasing her child rearing knowledge and skills, she would positively effect the child's developmental progress over a long period, including his school achievement. Early in the interention movement, mothers were not seen as especially important except insofar as they effected the child and the child's environment. This gradually changed, and goals for mother's own self concept and personal development were considered in program implementation. They were not, however, easy to measure.

By graduation, both mothers and children in the program groups in all four sites demonstrated significant differences attributable to their program participation. So, in the short run, PCDC did meet its goals of improving parenting skills and the intellectual development of children.

The long-term goals cannot be finally assessed at this point. Mothers do retain many of their improved child-rearing skills, for at least a year. This evaluation only included one year follow-up on the mothers. A follow-up evaluation was originally planned that would provide information on a wide range of mother effects.

The children from the earlier cohorts have been followed through second grade at this point. IQ differences were maintained for a year after graduation from the PCDC and generally disappeared by school entry; however, school achievement data in kindergarten (New Orleans) and first grade (Birmingham) indicated large group differences. Furthermore, program children in New Orleans were not placed in Title I compensatory education programs while over one-half of the control children were. Although achievement test scores of control children, many of whom were in special programs, may eventually equal those of program children there are many things we still do not know. It is very possible, based upon the Longitudinal Consortium findings (1978), that PCDC programs will continue to exert an influence on the children in ways which may be more significant for society than IQ and achievement. For example, fewer program children may drop out of high school, get into trouble with the law, or become dependent on drugs. At this point in time, the evidence is not all in.

Although not originally a program goal, PCDCs have been very successful in providing low-income mothers with a sense of support during the difficult child-rearing years. It is difficult to put a value on a feeling that you have someone to call when you need it; that others have the same or similar problems. It is becoming more obvious in this country that many mothers feel a need for this as parenting programs are springing up all over the country. Most of them are not intervention oriented, e.g., do not approach the participants of the programs as being disadvantaged in some way. Rather, often the participants are middle-class mothers who are seeking support from others in their same situation. Many of these programs are less expensive and do not attempt to be nearly as comprehensive as the PCDCs were.

The PCDC program model has wide scale applicability to groups with more specific problems, such as mothers of children with handicaps. For such groups, the comprehensive, integrated services, support, and education could be invaluable. As an intervention model designed only to improve the educational future of low-income and minority children, there remain some unanswered questions. PCDCs are expensive, and it is probably not even possible to fund enough PCDCs across the country to fully address the needs of the disadvantaged. On the other hand, PCDCs have demonstrated considerable short-term effectiveness in preventing intellectual deficits in children and in improving mother's parenting skills. If achievement test scores and IQ are all that count, then PCDCs are definitely not cost effective. If, however, other measures of social adjustment are considered, then PCDC programs may prove cost effective in the future.

To demonstrate strategy for program development, documentation, evaluation, and dissemination to inform social policy. In some respects, the PCDC experience did meet some of the above goals. Program development and documentation was carefully done. One set of replication programs were implemented and were, in fact, true instances of the original models. The evaluation data available from one site, Detroit indicates that program effects were obtained using the same model in a new site with a different population—and more impressive—on the pilot cohort. However, replication as a concept for study, lost its social base of support. The high cost of the total experiment became prohibitive in a time of decreasing human service resources. The issues and lessons learned about the replication process itself are beyond the scope of this report and are addressed in a separate paper by the Replication Management Organization (Shapiro, 1981).

Conclusion

The PCDC project was a social experiment on a grand scale. Comprehensive programs were designed to address a whole array of problems associated with poverty. A major criticism of "compensatory" education and social "intervention" is that attention is given to the wrong dimension of the problem. "The real focus of professionals should be not on the presumed deficits of poor families, but on the external sources of poverty and low educational attainment: our economic system, our laws, our social priorities, and our school systems" (Evans, 1971). Some may well argue with this point of view—contending instead that the root problem is our overemphasis on educational attainment to the detriment of personal happiness, regard and love for others, and pursuit of knowledge. Regardless of the reasons for the problems, they continue to exist, and our greatest mistake may well be that we stopped trying to solve them in the face of partial successes and limited resources.

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APPENDIX A

Individual Cohort Analyses

In this appendix, the means, the standard deviations, and the _t_-tests for key child and mother measures are presented separately by cohort at each of the three original sites. Birmingham results are presented first, followed by Houston and New Orleans results. Within each site, child measures are presented first, followed by mother measures and measures of mother-child interaction.

Birmingham cohort analyses. Unlike Houston and New Orleans, Birmingham did not have cohort designations because of the "trickle" recruitment model used there. In this model, mothers are recruited and enter the program continuously during the year, rather than a group of mothers starting together at the same time. For analysis purposes, artificial cohort designations were created in which mothers and children entering the program in two adjacent calendar years were placed in the same cohort. Thus, mothers and children who began the program in 1972 or 1973 were designated as being in the first cohort, those entering in 1974 or 1975 were placed in the second cohort, etc. Although some data were collected on pilot mothers and children prior to 1972, these data are excluded for several reasons. Prior to 1972, there was not strict random assignment to groups. Families were admitted with target children over six months of age, and the program itself was different in that it placed less emphasis on the mothers as the primary program participants.

Houston cohort analyses. Houston used letters to designate annual cohorts. Cohorts A, B, and C were exploratory groups that provided information for program planning. The parent education component in these cohorts was minimal. Cohort D was the first pilot group to receive the in-home program followed by the center program. Although families were supposed to be assigned to program and control groups at random, there were 10 entry variables on which control families scored higher than program families (e.g., better educated fathers, more bilingual parents, longer residence in the U.S., higher income). Cohort E started at the same time as Cohort D (late 1971), but received only the one year center program. Thus, Cohort F, which began the program late in 1972, was the first cohort that could appropriately be used for program evaluation.

In Birmingham and New Orleans nearly all program graduates were tested, and changing Ns from cohort to cohort accurately reflect changes in the number of graduates from year to year. However, in Houston changing Ns from cohort to cohort reflect primarily the greater or lesser success of the research staff in testing those mothers and children who graduated. For example, there were 25 program graduates in Cohort I, only 9 of whom were tested with the Stanford-Binet. In Cohort J, all but 3 of the 20 graduates were tested with the Stanford-Binet. Completeness of data collection in each cohort may be assessed by comparing the N for each measure in each cohort with the total number of graduates from that cohort. These totals for program graduates were as follows: F=25, G=19, H=17, I=25, J=20, K=27, L=17.

New Orleans cohort analyses. Yearly cohorts in New Orleans were assigned wave numbers. Wave 1 was the pilot cohort. Staff were being trained as this cohort proceeded through the newly developed program. Group assignment procedures approximated random assignment, but were not truly random. Eligible mother-child dyads were first assigned to either the program or control groups and then invited to participate. Thus, a mother who was assigned to the program group but was unwilling to make the time commitment required in the center program might refuse to participate. Group assignment procedures approximated random assignment, but were not truly random. Eligible mother-child dyads were first assigned to either the program or control groups and then invited to participate. Thus, a mother who was assigned to the program group but was unwilling to make the time commitment required in the center program might refuse to participate. A mother with a similar unwillingness to participate in a group program but who was willing to occasially bring her child in for testing might agree to be in the control group. This potential bias was avoided in later waves by assigning mothers to groups only after they agreed to participate in either group. In addition, for a short period of time during Wave 1 recruitment, all available mothers were assigned to the program group in an effort to fill the center quickly. Mothers recruited later were then assigned to the control group. Because it was a pilot group and because of these deviations from random assignment, Wave 2 was the first wave whose data was considered for this report. Wave 2 entered in 1972. Because of a variety of complications, no new mothers were recruited in 1973 or 1974. In order to indicate this gap in the program, the next cohort, entering in early 1975, was labeled Wave 4; Wave 3, then, never existed. Waves 5 and 6 entered in 1976 and 1977, respectively.

Birmingham

Bayley-Mental Development Index

22-months

	Program			Control			
Entry Year	N	M	SD	N	M	SD	t
72-73	58	96.40	9.49	49	86.47	12.33	4.70*
74-75	23	95.70	9.82	25	91.96	13.26	1.10
76-77	24	98.58	11.65	10	91.90	13.54	1.45
TOTAL	105	96.74	10.04	84	88.75	12.89	4.79*

*$P<.05$

A-5

Birmingham

Bayley Psychomotor Development Index

22-months

	Program			Control			
Entry Year	N	X	SD	N	X	SD	t
72-73	58	108.91	11.31	48	110.13	14.71	-0.48
74-75	23	111.70	10.95	25	105.92	11.22	1.80
76-77	24	108.88	12.49	10	101.40	15.86	1.47
TOTAL	105	109.51	11.46	83	107.81	14.06	0.92

$^{*}P<.05$

Birmingham

Concept Familiarity Index
36-months

	Program			Control			
Entry Year	N	X	SD	N	X	SD	t
72-73	55	26.82	4.96	43	25.91	4.65	-
74-75	22	28.45	4.98	24	26.58	5.74	1.18
76-77	20	26.80	4.06	4	23.00	4.08	1.71
TOTAL	97	27.19	4.80	71	25.97	5.01	1.59

*P<.05

Birmingham
Stanford-Binet
36-months

	Program			Control			
Entry Year	N	M	SD	N	M	SD	t
72-73	55	98.38	10.09	46	90.35	10.27	3.95*
74-75	22	97.55	12.35	25	93.40	13.25	1.10
76-77	30	96.40	9.53	8	92.13	17.28	.94
TOTAL	107	97.65	10.38	79	91.49	11.99	3.75*

*P<.05

Birmingham

Mother-Child Interaction Positive Interaction

24-months

	Program			Control			
Entry Year	N	M	SD	N	M	SD	t
72-73	32	62.50	31.82	18	41.83	24.53	2.38*
74-75	23	64.83	33.24	25	60.20	23.27	.56
76-77	29	85.10	25.94	15	46.93	25.97	4.62*
TOTAL	84	70.94	31.71	58	51.07	25.38	3.90*

*P<.05

Birmingham

Mother-Child Interaction Effective Teaching

24-months

	Program			Control			
Entry Year	N	M	SD	N	M	SD	t
72-73	32	10.58	2.17	18	8.37	2.34	3.35*
74-75	23	10.17	1.74	24	8.64	2.43	2.46*
76-77	29	9.98	2.09	14	7.39	2.07	3.82*
78-79	0	--	--	1	5.67	0.00	--
TOTAL	84	10.26	2.03	56	8.20	2.34	5.57*

*P<.05

Birmingham

Mother-Child Interaction Positive Interaction

36- months

	Program			Control			
Entry Year	N	M	SD	N	M	SD	t
72-73	48	61.65	30.66	38	51.45	28.93	1.57
74-75	22	63.36	28.08	25	56.84	30.48	.76
76-77	16	80.50	32.01	7	53.71	32.75	1.83
TOTAL	86	65.59	30.78	70	53.60	29.52	2.47*

*$P<.05$

Birmingham

Mother-Child Interaction Effective Teaching

36-months

	Program			Control			
Entry Year	N	M	SD	N	M	SD	t
72-73	48	12.35	2.26	36	10.95	3.04	2.41*
74-75	22	11.81	2.93	25	9.32	2.49	3.15*
76-77	14	11.49	2.57	6	10.20	2.42	1.04
TOTAL	84	12.06	2.49	67	10.28	2.86	4.09*

*P<.05

Birmingham

Mother-Child Interaction-Positive Interaction

48-months

	Program			Control			
Entry Year	N	M	SD	N	M M	SD	t
72-73	48	55.63	28.69	44	48.18	27.54	1.27
74-75	19	50.11	34.90	22	39.36	34.15	.99
76-77	5	57.80	35.06	3	56.00	13.22	.08
TOTAL	72	54.32	36.49	69	45.71	29.44	1.70

*P<.05

Birmingham

Mother-Child Interaction Effective Teaching

48-months

	Program			Control			
Entry Year	N	M	SD	N	M	SD	t
72-73	48	12.67	3.28	44	10.83	2.98	2.82*
74-75	17	12.52	2.42	19	10.96	2.69	1.82
76-77	4	13.21	1.07	5	10.70	3.10	1.53
TOTAL	69	12.67	2.98	68	10.86	2.87	3.62*

*P<.05

A-14

Houston

Concept Familiarity Index

36-months

		Program			Control		
Cohort	N	M	SD	N	M	SD	t
F	25	33.16	5.62	35	32.89	7.03	.16
G	18	39.39	4.02	21	35.29	6.66	2.28*
H	--	--	—		--	--	--
I	1	44.00	--	3	34.00	7.81	--
J	9	36.67	7.68	8	38.25	3.77	-.53
K	5	39.00	4.47	6	38.17	7.03	.23
TOTAL	58	36.33	6.07	73	34.64	6.81	1.47

* P<.05

Houston

Stanford-Binet IQ

36-months

	Program			Control			
Cohort	N	M	SD	N	M	SD	t
F	25	107.28	11.76	37	104.32	12.01	.96
G	19	109.21	12.76	21	103.48	14.33	1.33
H	6	106.17	13.56	1	83.00	0.00	1.58
I	9	96.78	14.18	5	93.00	15.60	.46
J	17	102.71	12.83	15	102.00	12.28	.16
K	12	117.67	8.98	7	112.71	12.65	1.00
L	14	108.43	13.05	12	102.83	10.96	1.17
Total	102	107.26	13.07	98	103.41	12.96	2.09*

*p <.05

Houston

Bayley Mental Development Index

24-months

	Program			Control			
Cohort	N	M	SD	N	M	SD	t
F	34	96.56	8.43	46	89.09	9.81	3.57*
G	31	98.68	16.04	27	94.22	12.94	1.15
TOTAL	65	97.57	12.59	73	90.99	11.26	3.24*

*P<.05

Houston

MISS: Mother's Affectionateness

36-months

	Program			Control			
Cohort	N	M	SD	N	M	SD	t
F	27	5.05	.26	38	4.82	.50	2.20*
G	29	5.09	.46	30	4.85	.47	2.01*
H	--	--	--	—	—	--	—
I	16	4.67	.60	8	4.06	.71	2.28*
J	5	4.37	.36	1	3.92	.00	1.14
K	2	4.42	.66	5	3.80	.60	1.20
TOTAL	79	4.93	.48	82	4.68	.61	2.89*

*$P<.05$

A-18

Houston

MISS: Mother's Praise

36-months

	Program			Control			
Cohort	N	M	SD	N	M	SD	t
F	27	2.30	.42	38	2.19	.47	1.01
G	29	2.11	.40	30	2.04	.37	.62
H	--	--	--	--	--	--	--
I	16	2.20	.45	8	1.68	.31	2.88*
J	5	2.08	.13	1	1.71	.00	2.51
K	2	1.74	.06	5	1.52	.55	.54
L	--	--	--	--	--	--	
TOTAL	79	2.18	.41	82	2.04	.46	2.04*

*$P<.05$

Houston

MISS: Mother's Use of Criticism

36-months

	Program			Control			
Cohort	N	M	SD	N	M	SD	t
F	27	1.27	.24	38	1.45	.37	-2.29*
G	29	1.11	.14	30	1.19	.29	-1.38
H	—	—	—	—	—	—	—
I	16	1.27	.34	8	1.40	.39	-0.80
J	5	1.28	.24	1	1.46	.00	-0.68
K	2	1.10	.14	5	1.26	.23	-0.88
L	—	—	—	—	—	—	—
TOTAL	79	1.21	.24	82	1.34	.35	-2.79*

*P<.05

Houston

MISS: Mother's Control of Child Behavior

36-months

	Program			Control			
Cohort	N	M	SD	N	M	SD	t
F	22	3.43	.25	34	3.44	.30	-0.02
G	20	3.21	.31	27	3.34	.38	-1.27
H	--	--	--	--	--	--	--
I	16	2.86	.22	8	3.18	.36	-2.69*
J	5	2.73	.23	1	2.42	.00	1.24
K	2	2.54	.41	5	2.49	.47	0.14
L	--	--	--	--	--	--	--
TOTAL	65	3.14	.38	75	3.30	.43	-2.28*

*$P<.05$

Houston

MISS: Mother's Encouragement of Child's Verbalization

36-months

	Program			Control			
Cohort	N	M	SD	N	M	SD	t
F	27	2.35	.42	38	2.22	.41	1.30
G	29	2.61	.49	30	2.43	.51	1.39
H	--	--	--	--	--	--	--
I	16	2.87	.60	8	2.45	.41	1.77*
J	5	2.81	.19	1	2.25	.00	2.68
K	2	2.88	.33	5	2.25	.64	1.29
L	--	--	--	--	--	--	--
TOTAL	79	2.59	.51	82	2.32	.46	3.57*

* $P<.05$

Houston

Locus of Control

36-months

	Program			Control			t
Cohort	N	M	SD	N	M	SD	
F	24	6.25	3.07	37	6.32	2.67	-0.10
G	20	6.40	2.44	24	5.83	2.58	0.74
H	8	8.13	2.17	3	6.66	2.89	0.92
I	11	6.36	2.62	4	6.50	1.91	-0.09
J	2	4.00	2.83	1	4.00	0.00	0.00
K	--	--	--	--	--	--	--
TOTAL	65	6.48	2.72	69	6.14	2.56	0.73

*P <.05

Houston

HOME - Total

36-months

	Program			Control			
Cohort	N	M	SD	N	M	SD	t
F	23	36.43	3.59	38	34.13	3.16	1.88
G	17	37.00	5.00	26	32.00	7.07	2.53*
H	5	29.80	6.14	1	21.00	0.00	1.31
I	10	36.70	4.37	8	34.75	6.71	.74
J	13	33.46	6.44	14	30.93	6.07	1.05
K	15	40.67	2.44	8	34.38	4.31	4.51*
L	16	39.56	2.00	13	36.15	3.41	3.36*
Total	99	36.98	4.93	108	33.39	5.90	4.73*

*P <.05

Houston

Parent as Teacher: Traditional Family Ideology

36-months

Cohort	Program N	Program M	Program SD	Control N	Control M	Control SD	t
F	24	34.38	6.81	38	31.32	4.09	2.21*
G	22	34.32	6.64	23	31.74	4.97	1.48
TOTAL	46	34.35	6.66	61	31.48	4.40	2.68*

*$P<.05$

Houston

Parent as Teacher: Index of Achievement Values

36-months

	Program			Control			
Cohort	N	M	SD	N	M	SD	t
F	24	21.13	3.37	38	21.53	3.60	-0.44
G	22	20.41	4.22	23	19.91	4.04	0.40
TOTAL	46	20.78	3.77	61	20.92	3.82	-0.18

Houston

Parent as Teacher: Psychological Well Being

36-months

	Program			Control			
Cohort	N	M	SD	N	M	SD	t
F	0	0.00	0.00	5	4.00	2.12	--
G	15	5.13	2.36	13	4.31	2.84	0.84
TOTAL	15	5.13	2.36	18	4.22	2.60	1.04

New Orleans
Stanford-Binet
36-months

	Program			Control			
WAVE	N	X	SD	N	X	SD	t
2	12	110.58	10.90	19	97.68	11.70	3.07*
4	22	102.05	8.96	15	99.27	12.40	.79
5	3	90.33	7.77	7	95.57	15.44	-.55
6	9	105.67	8.11	11	92.18	10.93	3.07*
TOTAL	46	104.22	10.36	52	96.69	12.20	3.27*

*P<.05

New Orleans

Concept Familiarity Index

36-months

	Program			Control			
WAVE	N	M	SD	N	M	SD	t
2	11	35.09	4.66	15	28.80	7.45	2.46*
4	16	32.38	4.54	14	29.07	6.23	1.67
5	2	32.50	6.36	6	30.33	8.38	.33
6	9	33.33	4.97	8	23.00	4.99	4.27*
TOTAL	38	33.39	4.69	43	28.02	7.01	4.00*

*P<.05

New Orleans

Ammons Full-Range Picture Vocabulary

36-months

	Program			Control			
WAVE	N	M	SD	N	M	SD	t
2	12	13.42	3.26	20	11.20	2.67	2.09*
4	20	13.65	3.54	11	11.45	2.02	1.88
5	2	11.50	3.54	7	10.29	5.35	.30
6	-	--	--	-	--	--	--
TOTAL	34	13.44	3.38	38	11.11	3.09	3.06*

NOTE: 1.88 = P = 07

New Orleans

Mother-Child Interaction % Positive Language

36-months

	Program			Control			
WAVE	N	M	SD	N	M	SD	t
2	9	83.78	16.77	12	74.00	17.26	1.30
4	13	75.54	8.37	14	65.21	24.07	1.47
5	3	92.67	1.15	8	62.75	20.77	--
6	6	76.17	21.78	8	71.75	23.32	.36
TOTAL	31	79.71	14.63	42	68.50	21.24	2.53*

*p<.05

New Orleans
Structured Teaching Task - Effective
Teacher Score
36-months

	Program			Control			
WAVE	N	M	SD	N	M	SD	t
2	11	10.85	1.03	13	9.65	1.40	2.34*
4	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--
TOTAL	11	10.85	1.03	13	9.65	1.40	2.34*

*P<.05

New Orleans

Stanford Parent Questionnaire-Old Form

Independence
36-months

	Program			Control			
WAVE	N	M	SD	N	M	SD	t
2	11	19.18	2.93	18	18.61	2.99	.50
4	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--
TOTAL	11	19.18	2.93	18	18.61	2.99	.50

*P<.05

New Orleans

Stanford Parent Questionnaire-Old Form

Aggression

36-months

	Program			Control			
WAVE	N	M	SD	N	M	SD	t
2	11	24.45	4.80	18	26.94	4.63	-1.39
4	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--
TOTAL	11	24.45	4.80	18	26.94	4.63	-1.39

*P<.05

New Orleans

Stanford Parent Questionnaire-Old Form

Punishment
36-months

	Program			Control			
WAVE	N	M	SD	N	M	SD	t
2	11	8.54	2.30	18	10.56	2.12	-2.40*
4	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--
TOTAL	11	8.54	2.30	18	10.56	2.12	-2.40

*P<.05

New Orleans

Stanford Parent Questionnaire-New Form

Independence

36-months

	Program			Control			
WAVE	N	M	SD	N	M	SD	t
2	1	16.00	0.0	1	12.00	0.0	--
4	15	12.93	2.87	14	12.64	3.05	.26
5	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--
TOTAL	16	13.13	2.87	15	12.60	2.95	.50

*P<.05

New Orleans

Stanford Parent Questionnaire-New Form

Aggression
36-months

	Program			Control			
WAVE	N	M	SD	N	M	SD	t
2	1	9.00	0.0	1	6.00	0.0	--
4	16	7.38	3.20	14	7.00	2.41	.36
5	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--
TOTAL	17	7.47	3.12	15	6.93	2.34	.54

*P<.05

New Orleans

Stanford Parent Questionnaire-New Form

Punishment

36-months

	Program			Control			
WAVE	N	M	SD	N	M	SD	t
2	1	5.00	0.0	1	4.00	0.0	--
4	16	3.94	1.48	14	5.43	1.79	-2.50 *
5	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--
TOTAL	17	4.00	1.46	15	5.33	1.76	-2.34*

*P<.05

APPENDIX B

Progress Report on Research Conducted in HISD Schools By The Parent-Child Research Center - 1979

Dale L. Johnson, Ph.D.
University of Houston

This report on data collected in HISD schools during 1979 by the University of Houston Parent-Child Research Center staff deals only with first run analyses. A more comprehensive report which will explore the antecedents of competence in school awaits 1) more data collection in the schools to build the sample size and 2) refinement of already collected antecedent data.

The project as a whole had two general objectives: 1) to evaluate the effectiveness of the Houston Parent-Child Development Center and 2) to search for the antecedents of school competence in early cognitive, linguistic, socio-emotional, and physical development. A copy of the research proposal as submitted to the Hogg and Spencer Foundations, the funding source for the project, was left with the HISD research division earlier. As may be seen in Figure 1, a wide variety of measures are included in our study.

In the late spring of 1979 information was gathered on 99 children in 40 schools, 36 of which were in the HISD system. The children were in kindergarten to grade three. The data collected included a teacher interview, teacher-rated classroom behavior, achievement test scores, and report card grades. The numbers of children at each grade and project cohort (annual groups of children selected for the project) and for each information source, are shown in Table 1.

The results of the data collection effort are incompletely analyzed at this time. However, certain general observations can be provided about the

PCDC program and control group differences.

Teacher Interview

1) There were no group differences in number of children being held at the same grade another year.
2) There were no group differences in number of children referred for special services.

(The other Teacher Interview data, e.g., on parental involvement, are not yet analyzed.)

Classroom Behavior Inventory

1) There were no overall group differences on any of the ten CBI scales.
2) Boys more often than girls were rated as showing "hostility". Girls were more often rated as "task-oriented".
3) Greater sex differences were found for the control group than for the program group.
4) The strongest single predictor of classroom behavior was the mother's interest in the mother-child interaction situation. This was significantly related to the child's extroversiveness. A copy of a summary of Kirk Goddard's M.A. thesis on this subject is enclosed.

Achievement Test Scores

Analysis of achievement test results with the present research population is complex because some of the children are Spanish-speaking monolinguals, others speak only English, and a large number are to some degree bilingual. Furthermore, some of the children were in bilingual classrooms and others were not. As the achievement tests are given in English, school achievement is confounded with language capability. We believe the complexity of the problem requires a number of different kinds of analyses and these are in process. For now, an analysis was carried out which takes into account whether the child was in a bilingual classroom, and the child's earlier language status.

Each child's bilingual abilities were assessed at age three. On this basis, and with information about the type of classroom the child was in, children were assigned to one of three categories for subsequent analyses: 1) English-speakers at age three and in ordinary classrooms, 2) Spanish-speakers at age three and in bilingual programs, and 3) Spanish-speakers at age three and in ordinary classrooms. The achievement test results are presented graphically in Figure 2.

It should be noted that the numbers of children in each category are not large and multivariate analyses have not yet been run.

With these limitations in mind, what appears is that the Spanish-speaking, no bilingual program, children have the highest achievement scores, and that this is equally true of program and control groups. The lowest scoring subgroup are the control children who are Spanish-speaking and in a bilingual classroom.

The significance of these results depends primarily on whether they will hold with larger numbers of children. If they do, then the most direct conclusion to be drawn would be that Spanish-speaking children do not require bilingual classrooms to achieve success in reading. Before reaching such a conclusion, we would compare groups as to intelligence of the children, linguistic ability at the present time, kind of family language usage, and a number of other factors such as the presence of older siblings in the family. These additional analyses are essential, but cannot be done with present sample sizes.

Another finding from the analysis of the achievement test data is that overall reading achievement for the program group (mean = 49.5) and control group (mean = 47.6) are virtually the same. It is also worth noting that both of these means are very close to the 50th percentile, suggesting the children are making normal progress in school.

Wechsler Intelligence Tests

WISC-Rs and WPPSIs were administered to 37 children of school age. Not all of these children were tested in school because some schools lacked facilities for psychological testing; e.g., Franklin school was being renovated and had no quiet space for testing.

The results of the Wechsler testing are shown in the attached table. This table gives the mean Verbal and Performance scores for children in the preschool years as well as for older children. Results are shown in Figure 3 for program and control groups with a further breakdown by sex.

There were no significant differences between groups for girls at either age level. However, group differences did appear for boys. Younger boys who had been in the PCDC program had significantly ($p < .02$) higher Verbal IQs than control boys. Among the older boys, differences again favored the program group, but on the Performance scale. This was significant at the .04 level.

Interpretation of these results for program evaluation purposes depends on whether the sample of children located in this follow-up study are similar to the sample at the time of random assignment to program or control groups.

It should be noted that overall, Verbal scores are lower than Performance scores by about 10 points (92.3 to 101.8). These results are congruent with those of the reading achievement test scores in that both show average levels of functioning.

TABLE 1

Total School Data Collected

1979

Grade	Cohort	Measure	Group		
			Experimental	Control	Total
3	E	CBI	9	7	16
		TI	10	7	17
		Ach	8	7	15
		Grades	9	6	15
2	D	CBI	12	11	23
		TI	12	12	24
		Ach	10	9	19
		Grades	12	11	23
1	F	CBI	17	22	39
		TI	17	22	39
		Ach	12	20	32
		Grades	15	21	36
K	G,H	CBI	6	12	18
		TI	6	13	19
		Ach	-	-	-
		Grades	-	-	-

CBI:	Classroom Behavior Inventory
TI:	Teacher Interview
Ach:	Achievement Test Scores
Grades:	Report Card Grades

FIGURE 1

LONGITUDINAL STUDY MEASURES

MEASURES	DATA COLLECTION TIME AT CHILD AGE				
	4	5	6	7	8-9
Mother					
Parent Practice Interview	X	X	X	X	X
Psychological Well-Being	X	X	X	X	X
Behavior Assessment	X	X	X		
Home Behavior Inventory		X	X	X	X
Mother and Child					
Mother-Child Interaction	X	X	X		
Mother, Father & Child					
Parent-Child Interaction					X
Child					
Bilingual Syntax Measure	X	X	X	X	X
Carrow's Test for Auditory Comprehension	X				
Stickers - Creativity	X	X			
WPPSI	X	X			
WISC-R (abbreviated)			X	X	X
Satz - Finger Localization		X			
- Recognition Discrimination		X			
- Alphabet		X			
Circus - How much & how many		X			
Children's Embedded Figures Test			X	X	X
Rod & Frame Test			X	X	X
Locus of Control			X	X	X
Holtzman Inkblot Test					X
Parental Acceptance - Rejection Questionnaire					X
Children's Manifest Anxiety Scale					X
Coopersmith Self-esteem Inventory					X
Need Achievement Stories					X
School Achievement Tests			X	X	
Teacher					
Classroom Behavior Inventory		X	X	X	X
Teacher Inventory		X	X	X	X
School Grades			X	X	X

FIGURE 2

READING ACHIEVEMENT TEST

FOR THREE LANGUAGE GROUPS

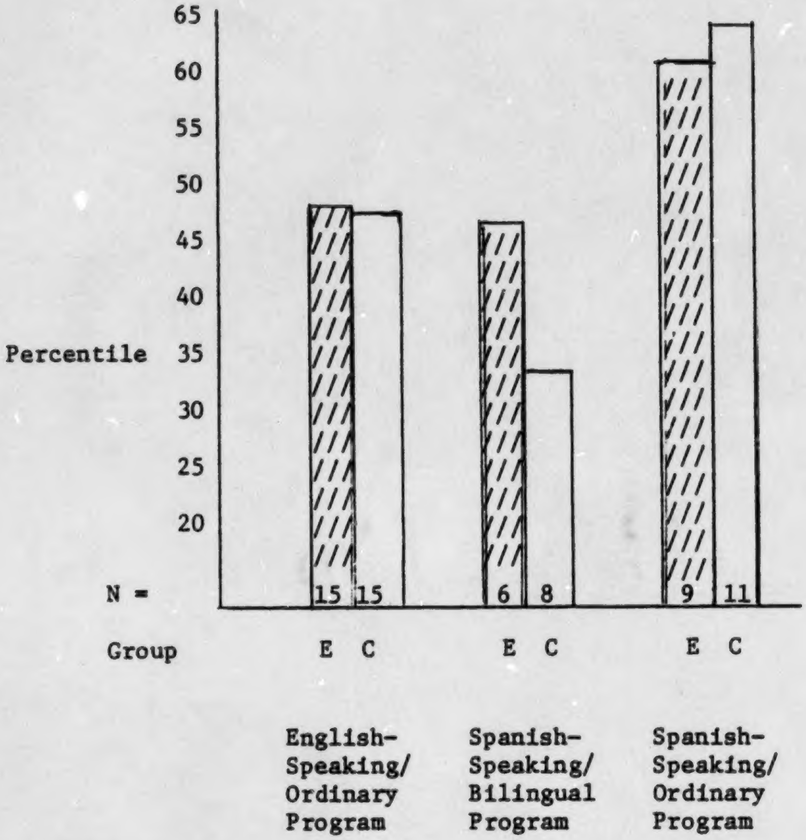

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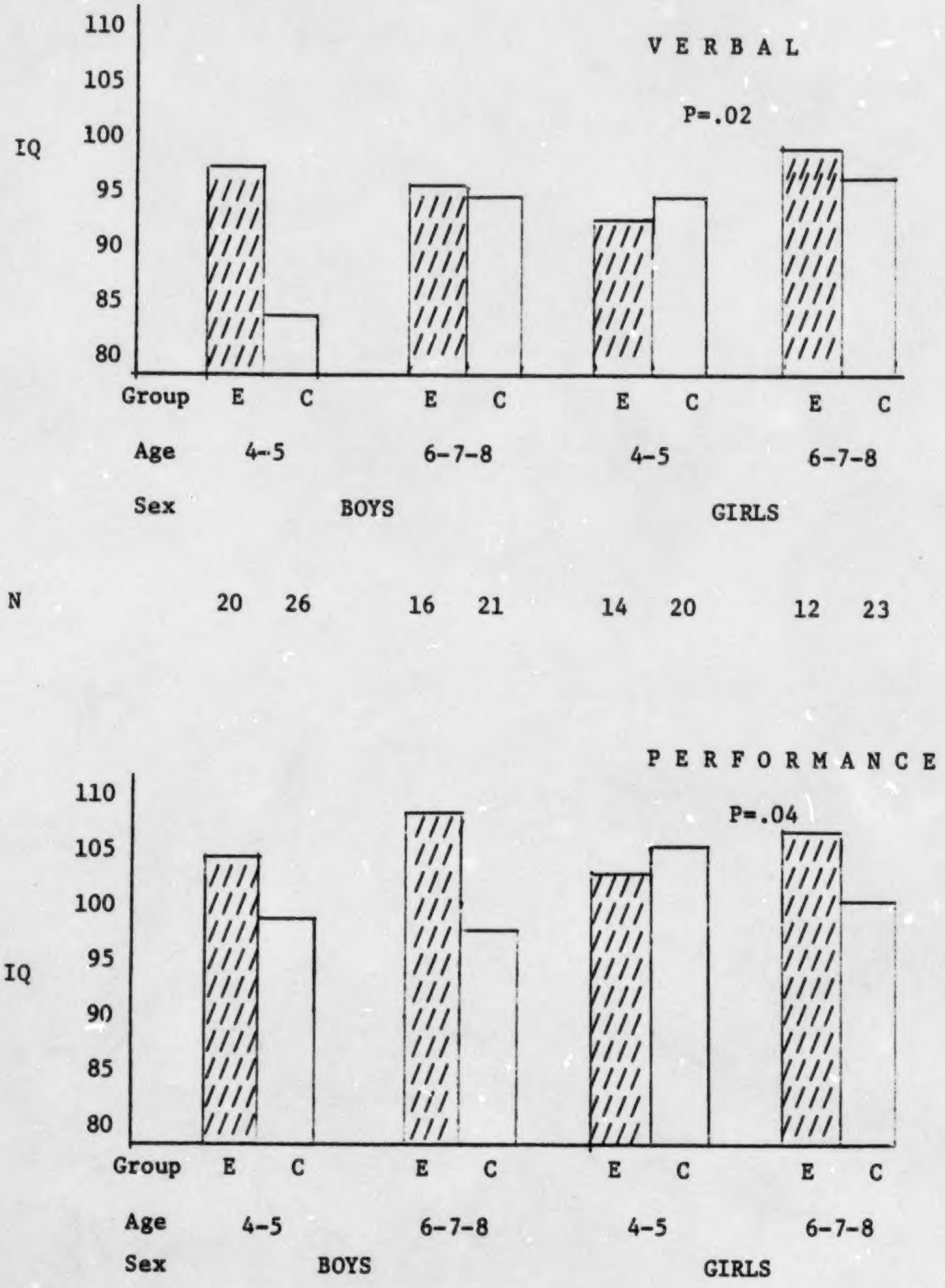
FIGURE 3

WECHSLER RESULTS



CLASSROOM BEHAVIOR AND ITS PREDICTION BY EARLY MOTHER CHILD INTERACTIONS

An Abstract of a Thesis
Presented to
the Faculty of the Department of Psychology
University of Houston

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

By
Kirk Jude Goddard
December 1979

ABSTRACT

The two questions addressed were (1) how children from an early intervention program would be rated on a classroom behavior inventory when compared to a control group and (2) what type of relationship exists between these beh behavior ratings and a set of mother-child interaction variables collected when the children were 36 months old. The classroom behavior ratings were performed by teachers of kindergarten and first grade children. The maternal variables consisted of: The Home Observation of the Measurement of the Environment, and a video-taped mother-child interaction procedure which yielded ratings of mother's affection, mother's criticism, mother's encouragement of the child's verbalization and mother's interest in the situation.

Data analysis was performed by means of multiple regression and multivariate analysis of variance. There were no group differences on the Classroom Behavior Inventory scores. Results for the predicting part of the study, indicated that in the program group, mother's interest in the situation was significantly related to the personality dimension of Extraversion-Introversion, while in the control group mother's affection was negatively related to the children's Extraversion. Sex differences were strongly suggested on two of the three Classroom Behavior Inventory factors, Task Orientation-Distractibility and Considerateness and Hostility, with girls being rated higher in both Task Orientation and Considerateness.

APPENDIX C

Birmingham Graduation Interview

I'm interested in how people handle different types of situations. I will describe several situations. I want you to pretend you are in the situations I describe, and I want to know how you think you would actually handle the situation. There are no right or wrong answers but there are differences in the way people would handle these situations, and I'm interested in what you would do. When I turn on the tape recorder, I will describe the first situation. Tell me how you feel you would handle it. There is no time limit to your responses.

A.1 Pretend you are on welfare. You are in a car wreck in which there is a lot of damage to your car. When you get out of your car you learn that it is your caseworker who has run into you. When she recognizes you, she tries to get you to forget the accident saying she could have you kicked off welfare. It is clearly her fault. What would you do?

A.2 What would you do if you belonged to a church and the minister decided the church should do something you feel is very wrong?

A.3 You and your husband (boyfriend) have been fighting alot lately. Every time you say something, he argues with you. You seem to be nagging at him alot. You care about him too much to want th relationship to end. One evening, the two of you have plans to leave for the movies at 6:00. He's ready to go 15 minutes before 6:00, but you're not ready to go until one minute before 6:00. As you get together, he complains that you are late and that you don't consider him. In other words, this is the start of another one of your fights. What would you do?

A.4 A salesman comes to your door to sell you some burial insurance. He says it is a new company and it sounds like a good deal. You sign up for yourself and your family and pay him the first payment of $5.00 and he gives you a receipt. You never get a policy nor another bill. What would you do?

A.5 You have gone to the clinic or doctor's office for a routine physical exam. You are in the waiting room with three other adults whom you have never seen before. There are no children. The nurse announces that an emergency has come up and there will be several minutes before the doctor can see any of you but you should wait. What would you do while you were waiting?

A.6 Your 2 year old has lost his appetite. He doesn't like anything that is put in front of him any more. He seems to only wnat snacks like soft drinks and potato chips in between meals. What do you do?

A.7 A new neighbor moves in next door and she has a 17 month old baby. She says her mother keeps after her about the child not being potty trained yet. She's been trying for several months but he keeps wetting his pants. She asks you for your advice. What would you tell her?

A.8 The landlord has just locked your sister and her kids out of her apartment because she is a week late paying her rent. He will not take her money and says he is entitled to keep all her furniture and things for non-payment. She asks you what she can do. What would you tell her?

A.9 Your child keeps coming home from the first grade with bruises his teacher has given him. He says she pinches him when he does not know the answers to questions and paddles him every time he speaks during class. What would you do?

* * * * *

We're through with the situations, and I have some other things to ask you about.

B.1 Some people say that experiences in the first 3 or 4 years of a child's life are not important as far as what happens to the child when he grows up. Other people say that these first 3 or 4 years mean everything to the child. How do you feel?

B.2 How much do you think you can affect the development of your child? In what ways?

B.3 Some mothers feel that the things they do as a parent are the most important things in their lives. Other mothers feel the things they do as a parent are not very important to themselves as people--other things are much more important. How do you feel?

B.4 Some people believe that all children are basically good. Other people believe that all children are basically bad and that unless the badness is gotten out of the child, they will turn out to be bad adults. How do you feel about this?

* * * * *

C.1 A discount store near you is having a big sale on clothes for the whole family. What are some things you would think about as you decide which clothes to buy?

C.2 What are some things you think about when you plan a menu (meal)? What did you fix for supper last night (night before last)? Give an example of a menu you might plan for a Saturday, keeping in mind the amount of money you have to spend.

C.3 When should you call the doctor about your child being sick? When your child is sick enough, what information should you have ready before calling?

C.4 How is a woman's health affected by having a baby? What happens to a woman's body if she has several children less than a year apart?

C.5 Some mothers think that tying a string with a penny around a baby's neck will make them cut teeth. What do you think about doing this? What could happen if you did?

C.6 Your cousin has come to visit you for a few days from out of town and she brought her one year old baby. She tells you one night after the baby has gone to sleep that she's been feeling tired and exhausted, she's been very irritable with her baby (yelling and spanking alot). She's also been irritable with other people and she feels she can't cope any more. What could you tell her?

C.7 If you're feeling good, is it still necessary to go to the doctor for a regular check-up? If you went, what should you have checked and how often? When was the last time you went in just for a check-up?

* * * * *

D.1 If you were suddenly without any money and had no immediate income, where would you go for help?

D.2 If you felt very sad and felt like you were about to commit suicide, what would you do?

D.3 If the Power Company was about to shut off your lights and you had no money, where would you go for help?

D.4 Your child just swallowed some kind of poison. What would you do?

D.5 You feel that your child is having severe mental problems. What would you do? What kinds of things that you see in your child would tell you that child is having mental problems?

* * * * *

Ask 3 year old child's name. What do you do when _______:

E.1 Refuses to go to bed even though it's past his/her bedtime but he/she still wants to stay up?

E.2 Hits a younger brother or sister or neighbor's child?

E.3 Promises you he/she will not leave the porch and then goes next door to play without telling you?

E.4 Lies to you?

* * * * *

F.1 What are some of the things you do and have around the house that help your children learn more?

F.2 What types of things do you do around your house to make it safer for your children?

E.3 How has your life changed over the last 3 years?

E.4 In your feelings about yourself and your ability to handle things, how has this changed over the past 3 years?

E.5 What do you do for fun for yourself? How has this changed over the past 3 years?

E.6 Take a couple of minutes and think of how many close friends you have (people you feel close to, like, discuss personal problems with, can go to for help, are relaxed with). How many are there? How many of these have you met as a result of having been involved in the Parent-Child Development Center?

Scoring for the Birmingham Graduation Interview

The intervew consists of two types of questions: (1) verbally described structured situations for which a plan of action or solution is required and (2) simple information questions. The structured situations depict potential conflicts or difficulties with representatives of community agencies (6 situations), with other adult family members or friends (5 situations) and with children (7 situations). The simple information questions require a verbal report about hte mother's experience (e.g., "How has your life changed over the past three years?") The entire interview is tape recorded.

Scoring is done by two specially trained raters who are blind to group membership of the interviewees. An estimate of the individual's General Life Situation is derived from responses to a single question ("How has your life changed over the last three years?") Good changes are the number of positive changes described; bad changes the number of negative changes mentioned. Satisfaction with changes is rated on a three-point scale for each of the changes reported and averaged.

In order to assess the Child Control techniques used by the mother, four situations involving the mother's three year old are described—refusal to go to bed after bedtime, hitting a younger sibling, breaking a promise to remain on the porch, and lying. The three dimensions scored include use of reason for control which was rated on a four point scale indicating the degree to which the mother verbalizes reasons cause-effect relationships; discussions used in discipline, the number of situations in which discussion is mentioned in teaching discipline to her child: physical punishment - the number of situations in which corporal punishment is mentioned as a control technique.

The mother's approach to solving adult problems is analyzed in three ways: Style of Problem Solving, Achieving Solutions and Response to Authority. Nine hypothetical problems include a car wreck with her welfare case worker, her minister deciding her church should do something the mother feels is wrong, conflict with her spouse (or boyfriend), an insurance company losing her down-payment, a long wait in a doctor's office, her child refusing to eat anything but junk food, a new neighbor asking about toilet training, a landlord locking her sister's family out, and her first grade child coming home with bruises he said his teacher gave him.

Style of Problem-Solving includes four types of ratings. Interpersonal orientation is rated on a three point scale according to the degree to which the mother indicates taking into account other peoples' feelings and rights. Punishment orientation is a dichotomous rating of proposed solutions involving the presence (+1) or absence (0) of negative action toward someone without clear problem-solving or teaching intent. Discussion is a dichotomous rating of the presence or absence of indications that a verbal discussion with the person in conflict would be attempted. Information seeking is a dichotomous rating of accepting someone else's explanation of situations at face value.

Four aspects of the responses to the situations are rated for their judged potential for Achieving Solutions to problems. Alternatives are the number of solutions the mother proposed. Number of resources is the number of different sources of assistance or information mentioned in response to all nine questions. Competence is based on a 4-point scale of the likelihood of success of the proposed solutions. Persistence was based on a 4-point rating scale of the stated intent to persist until the problem solution.

Two aspects of responses are rated as indicating Response to Authority in solving problems. Power/status orientation is a dichotomous rating of whether the individual immediately proposes turning to an authority figure (e.g., police to solve a problem or whether the individual initially attempts to resolve the problem herself. Appropriateness of authority figures is a dichotomous rating of each authority figure mentioned as being appropriate (e.g., patrolman for auto accident) or inappropriate (e.g., judge for auto accident) for each situation.

APPENDIX D

Complete Maternal Behaviors at 24 Months

New Orleans MCI
Houston MISS
Houston HOME

TABLE D-1

Complete Maternal Behaviors on New Orleans Mother-Child Interaction

Waiting Room Observations

24 months

Maternal Behavior		Program	Control	t
Sensitivity - Insensitivity	N	8	7	
	M	6.63	4.00	4.33**
	SD	1.30	1.00	
Acceptance - Rejection	N	8	7	
	M	7.38	5.43	2.27*
	SD	.92	2.22	
Interference - Cooperation	N	8	7	
	M	7.25	4.00	3.22**
	SD	1.39	2.45	
Net Positive Language	N	8	7	
	M	24.63	-25.71	2.74*
	SD	44.16	21.31	
Positive Language	N	8	7	
	M	62.25	37.00	2.75*
	SD	22.13	10.63	
Control Language	N	8	7	
	M	30.38	44.57	-1.70
	SD	18.46	13.00	
Negative Language	N	8	7	
	M	7.25	18.14	-1.85
	SD	9.15	13.54	

*p<.05

**p<.01

TABLE D-2

Complete Maternal Behaviors on Houston Structured Teaching Mother-Child Interaction

24 months

Maternal Behavior		Program	Control	t
Mother's Affectionateness	N	112	99	
	M	5.02	4.94	1.44
	SD	.37	.40	
Mother's Praise	N	112	99	
	M	2.04	2.11	-1.13
	SD	.42	.42	
Mother's Use of Criticism	N	112	99	
	M	1.25	1.27	-.44
	SD	34	34	
Mother's Control of Child Behavior	N	112	99	
	M	3.23	3.29	-1.16
	SD	.29	.36	
Mother's Use of Reasoning	N	112	99	
	M	1.11	1.12	-.68
	SD	.14	.16	
Mother's Encouragement of Child's Verbalization	N	112	99	
	M	2.17	2.24	-1.22
	SD	.35	.45	
Mother's Net Positive Behavior (Affection + Praise + Encourage Verbalization-Criticism)	N	112	99	
	M	7.98	8.02	-.24
	SD	1.05	1.11	

*p<.05

**p<.01

TABLE D-3

Complete Maternal Behaviors on Houston Home Inventory

24 months

Factor		Program	Control	t
Emotional and Verbal Responsivity of Mother	N	187	131	
	M	9.25	9.11	.58
	SD	2.22	2.16	
Avoidance of Restriction and Punishment	N	187	131	
	M	4.99	5.64	-2.83*
	SD	2.28	1.59	
Organization of Environment	N	187	131	
	M	4.97	5.13	-1.39
	SD	1.07	.95	
Provision of Appropriate Play Materials	N	187	131	
	M	7.26	6.08	5.52**
	SD	1.71	2.09	
Maternal Involvement with the Child	N	187	131	
	M	3.91	3.53	2.12*
	SD	1.66	1.52	
Opportunities for Variety in Daily Routine	N	187	131	
	M	4.04	3.19	6.75**
	SD	1.02	1.20	
Total (1-6)	N	187	131	
	M	34.35	32.52	2.61**
	SD	6.00	6.38	

*p<.05

**p<.01